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### Index and Title Page for Vol. IX.

The 8-page Index for Vol. IX of "FLIGHT" (January to December, 1917) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 8d. per copy, post free.

## EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."—  
(Sir Auckland Geddes, Minister of National Service.)



THE grim events in the West have focussed the attention of the nation on the vital problem of man-power in a way that nothing in the whole three-and-a-half years of war has done. At last the country has awakened to the realisation that nothing short of the exertion of our maximum effort will serve to avert disaster, let alone to achieve that complete victory which is our goal.

But, at the same time, it has led to a great deal of loose talking as to the definition of what really does constitute our "maximum effort" and whether the latter is to be expressed in terms of

men for the army, or whether there are not other directions, equally essential, in which a powerful effort is required at the apparent expense of the numbers of men we can draft into the ranks of the fighting services. We agree entirely that the first need is MEN. They must be found in large numbers to replace the very heavy casualties our armies fighting in France and Flanders must have suffered, and also to ensure that when the time arrives for the launching of a great Allied counter-stroke there shall be a sufficient weight of man-power behind it to make it decisive. But the inevitable question arises as to what is the maximum number of men this country can find without fatally disturbing the essential equipoise between our military, naval and economic requirements. We cannot withdraw men from the essential work of shipbuilding to fill the gaps in the ranks of the army, else we disturb that equipoise to a degree which, it is quite clear, may prove disastrous to the nation in the long-run. We must have ships to replace the losses caused by the enemy's submarine campaign, or the nation would ultimately starve. So much is not in dispute, but there are some who think ships and munitions the end of all things. The advocates of the ruthless use of the comb—those who preach the doctrine of calling out the whole manhood of the country and drafting it into the army "at all costs"—do not appear to realise, or at least they ignore, the fact that the country is not a bottomless reservoir of men, money and materials, and that even the resources of the British Empire have their limits. They will not see that the moment we exceed the permissible limits of drawing upon those resources in any one of these essentials we are so lowering the vitality of the nation that we are inviting disaster almost as complete as would follow on the defeat of our armies in the field.

We do not for a moment suggest that the men ought not to be found, or that we find ourselves in opposition to the broad outlines of the Government's proposals as disclosed by the new Man-power Bill. On the contrary, we are in complete agreement with the principle of putting in, not our "last man"—for that we do not conceive to be either necessary or practical in its last reduction—but the last man who can be spared without lowering the national economic vitality below the danger point. The Government is asking that the military age be raised to 50, and even in some cases to 55. Well, the country has no

quarrel with the principle if its necessity be established, but before it is applied there must be anxious enquiry as to the effect to be produced on our economic stability by the taking away of men of mature age from established businesses, even though the latter are classed as "unessential." It is as well to point out that no business is really unessential from the point of view of the preservation of economic stability, and to rule that because a certain business is only contributing its quota of taxation to the war and is not directly engaged in the production of munitions of war it is therefore unimportant to the nation is foolish. There are certain businesses which may have to be sacrificed to the exigencies of the situation, but their sacrifice must represent some amount of dead loss to the nation in any case. We cannot have it both ways, but it becomes at some time or another a very serious question as to which way we shall have it, and one which is not to be approached in the spirit of levity with which a certain type of official and publicist too often deals with the subject of the breaking up of industries and businesses. Before the older men who are bearing the economic burden of the war are taken, thus disturbing the whole of the fabric of taxation and economy, it must be made certain that the comb has been ruthlessly put through the classes engaged on what is euphoniously known as "work of national importance," which is only too often a cloak for dodging military service in the funk-holes of Government and municipal departments. In a very large number of these cases the work that so-called indispensables are supposed to be doing is entirely superfluous, while in a still greater number it could equally be done by men who have been discharged from the Services or by women. Then there is the question of the alien within our gates. Thousands of these visitors to our shores are filling situations which have been given up by good Britishers who are overseas fighting our battles. This question has assumed dimensions which justify us in describing it as a scandal. Before we proceed to call out our elderly business men, there are thousands of hearty young aliens who should be told that if England is worth living in, she is worth fighting for, and that they can choose between the choice of fighting, doing work of national importance, or returning to their native lands. Then, there are the "conchies" whose conscience is in most cases simply a camouflaged term for cowardice. It is intolerable that these pitiful cravens should be given legislative preference over men who have given their sons, and even their grandsons, to the war.

To sum up the whole case, the Government having taken its powers, will be judged by the country by the manner in which it applies them. They have it in their power to straighten out the whole question of man-power as it should have been done nearly three years ago. On the other hand, if those powers are unwisely applied it may result—and that quite easily—in economic disaster of the first magnitude.

#### The Germans and Reprisals.

Evidence is accumulating that the Allied reprisal raids on German towns are producing the precise psychological results predicted for them. Letters found on prisoners taken at the front contain luridly descriptive details of the terrors caused by the appearance of Allied aircraft over the Rhineland towns, indicating that the populations

are really in a state bordering on panic. If these stood by themselves it would be unsafe to assume that the effect was general. No doubt many such letters have been written to our own soldiers at the front by people living in the areas most affected by German raids on this country, but we know full well that they do not represent the real feelings of the majority of the populace. On the contrary, enemy air raids on our towns have only served to steel the determination of British people to see the war through to a successful conclusion. Of anything approaching panic there has been nothing. But the evidence that the Germans are really afraid of reprisals does not by any means rest on the testimony of a few individual letters. When bodies like the town council of Mainz actually go to the length of passing resolutions of appeal to the German Government to refrain from the bombing of towns outside the actual war zone, it becomes quite clear that the matter is generally regarded as serious. It indicates that these cowardly civilian Huns, who vociferously applauded the murder of enemy women and children by Zeppelin and aeroplane bombs, are deadly afraid for themselves now that the only possible deterrent is being applied and the German towns within reach of the Allied lines are being periodically dosed with the medicine which the Hun in his blindness believed to be his own monopoly.

The telegrams sent by the Grand Duke and Duchess of Baden to the Chief Burgomaster of Coblenz are also evidence of the profound effect produced on the gentle Hun by the visitations of Allied aircraft. The Grand Duke telegraphed:—

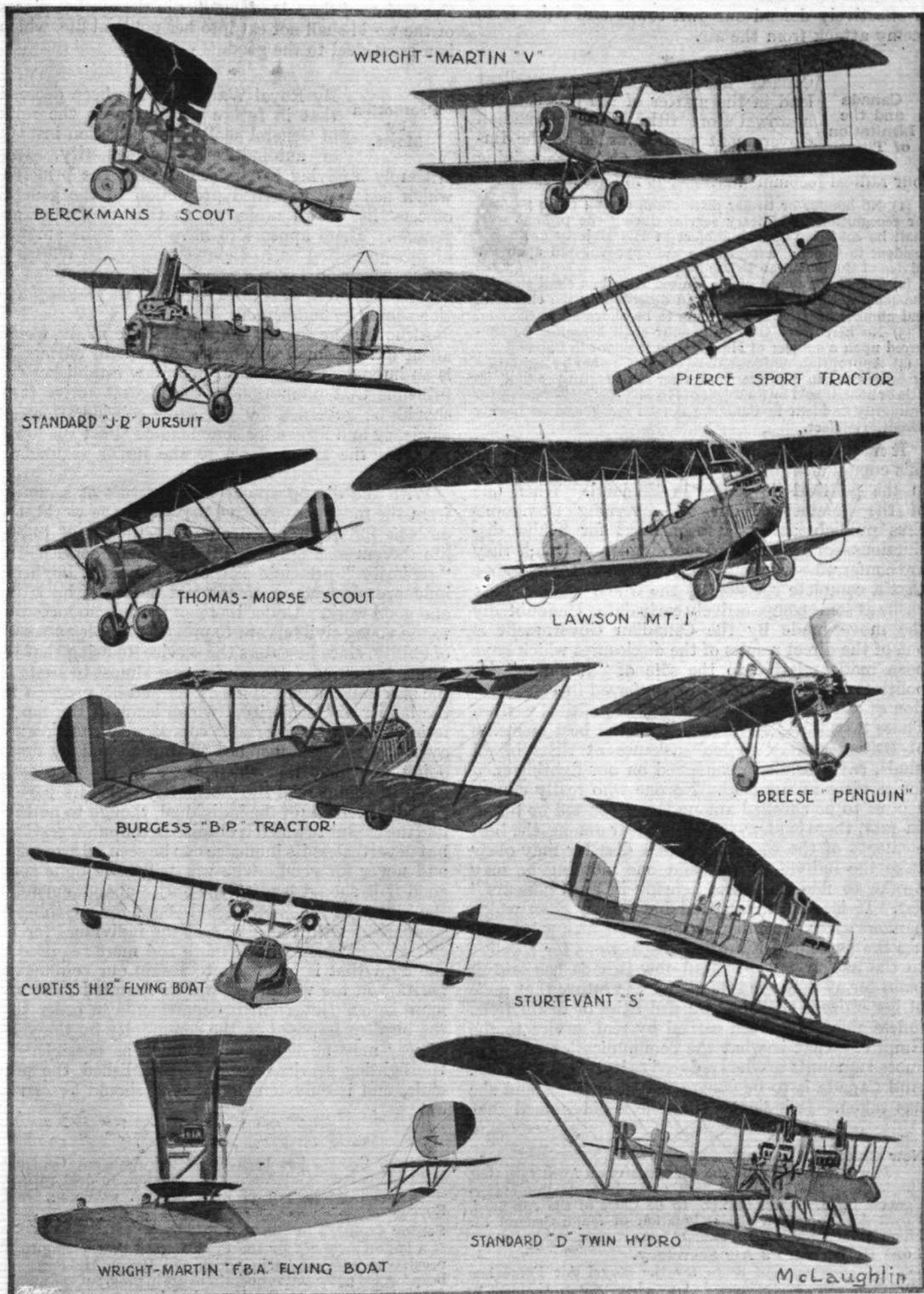
"The Grand Duchess and I read with indignation of the severe air attack upon the dear town of Coblenz. We sympathise most heartily at the lamentable loss of innocent human lives. May God continue to protect the town."

The Dowager Grand Duchess of Baden telegraphed:—

"With the deepest regret I learn of the grievous visitation which has now for the first time struck Coblenz, a town so dear to me and so full of memories. I express my heartiest sympathy at this terrible event. God grant that this may be the last occasion on which you are subjected to such a trial."

However, it is no use deluding ourselves into the belief that the German High Command will listen to the protests of town councils or even of much more influential bodies or personages, until it has thoroughly demonstrated that the game of raiding open towns is not worth the candle. The constant bombardment of Paris by their long-range guns is earnest enough of the fact that the psychological effect of "frightfulness" on civilian populations is regarded by them as a weighty factor in war. At the same time, the argument cuts both ways. It is quite clear that belief in the effect on enemy populations must be accompanied by an equal belief in a similar effect on their own if the Allies should determine to adopt a whole-hearted policy of ruthlessness. That being so, it simply becomes a question of profit and loss, so to say, and the moment the debit balance is transferred to the other side of the ledger we may expect the Hun to suggest that the account should be closed. But a few detached resolutions such as that to which we have referred will not convince the German Government that the balance has so passed. We shall have to perpetrate quite a lot more frightfulness yet to bring them to a better frame of mind. We deplore the necessity, but we cannot help ourselves if we want





American aeroplane types of 1917-18.

("Aerial Age," U.S.A.)

to effectively defend our own towns and cities from enemy attack from the air.

#### Canada and the Limitation of Titles.

Canada has given us an excellent lead in the matter of the promiscuous bestowal of titles. The Canadian Government has forwarded to the Imperial authorities an Order, containing four radical recommendations, as follows:—

- (1) No honour or titular distinction, saving those granted for recognition of military service during the present war, shall be conferred upon a subject of His Majesty ordinarily resident in Canada, except with the approval and upon the advice of the Canadian Prime Minister.
- (2) The Government of the United Kingdom shall exercise the same authority as hitherto in determining the character and number of titles and honours to be allocated to Canada.
- (3) No hereditary title or honour shall hereafter be conferred upon a subject of His Majesty resident in Canada.
- (4) Appropriate action shall be taken, whether by legislation or otherwise, to provide that after a prescribed period no title or honour held by a subject of His Majesty now or hereafter ordinarily resident in Canada shall be recognised as having hereditary effect.

It may be taken as certain that the publication of this communication has caused a considerable flutter in the political dovecotes in England. When one of the greatest of our self-governing Dominions thus publicly asserts its contempt for titular distinctions—or rather, for the manner in which they are conferred—it follows almost as a matter of course that a complete revision of the whole system must ensue at some comparatively early date. Undoubtedly the move made by the Canadian Government is one of the direct results of the disclosures which have been made relative to the sale of “honours” for political services rendered or conferred in consideration of contributions to the funds of political parties. These disclosures have caused all the best elements of British society to look askance at titles of all kinds, save for those conferred on our fighting men for services in the field. No one who really counts aspires to be enrolled among the decorated or titled. In fact, there is an ever-present fear among the best elements of the community that disaster may overtake the individual and that one morning he may awake to find his name figuring in an “honours” list. It is only the retired buttermilk class which hankers after these distinctions. To such a low ebb has the system of awarding distinctions for services to the nation fallen! And now Canada has said in plain terms that she intends for the future that none of her citizens shall be awarded titles or distinctions unless they have been earned by real service to the Empire. That is what the communication we have quoted amounts to when reduced to its real dimensions. And Canada is to be congratulated on the stand she has taken. It indicates that she is determined that

the canker of the sale of honours in the market places of the world shall not eat into her political life, which is a great deal to the good.

#### Promotion by Merit.

By Royal Warrant it has been decreed that in future promotion to the rank of General shall be by selection instead of automatically by seniority. This is simply applying to the senior rank the principle which has long governed promotion to the general officers' list in all ranks up to that of lieutenant-general. There appears to have been some amount of misconception as to the meaning of the Warrant, which has been taken to include *all* promotions to the general rank, so it is as well that its real application should be understood.

Although the reform is one which, normally, would affect a very small proportion of general officers, it is an important one since it definitely establishes the principle that promotion to the highest active rank should be governed by the same considerations of efficiency and fitness for command as affect the lower ranks of the army, down to the junior regimental officers.

With the disappearance of the fetish of seniority from the most conservative Service in the world, the outlook for merit in all our departments of public life becomes brighter. In the Civil Service the “seniority” principle has operated as a blighting influence, destructive to the last degree of initiative and good work. Under its reign there is no incentive to the young civil servant to prove that he is possessed of ability, since he enters the service knowing that his future is assured. He can forecast almost to a month the successive stages of his career and his progress up the ladder of “seniority,” which leads at the top to retirement on a comfortable competency to be earned easily by simple adherence to routine and by never doing anything for which there is no precedent. Even in commercial life “seniority” has its part in the advancement of the individual, though to nothing like the extent to which it obtains in the public services, but nevertheless its influence can be seen all around us and never for good. The war will have done some good if it should lead to the entire abandonment of the idea that seniority should count for anything in comparison with the fitness of the individual for his work. Efficiency will be more and more required in the fight that is before us to regain our commercial position in the world. It will be required more and more in our Government departments in order that the burdens imposed on the community by the years of war may be lightened as much as possible. In the fighting services we have established the principle, and it only remains that it should be carried on.

#### New Chief of Air Staff.

It was announced by the Air Ministry on April 13th that His Majesty the King has been pleased to appoint Major-General F. H. Sykes, C.M.G., to be Chief of the Air Staff, Royal Air Force, on the resignation of Major-General Sir Hugh Trenchard, K.C.B., D.S.O.

#### Lord Rothermere's Air Secretary.

The Secretary of State for the Royal Air Force has appointed Brigadier-General Guy Livingston, C.M.G., to be Air Secretary to the Secretary of State, combining the duties with those of his appointment as Deputy-Master General of Personnel in the Air Ministry.

#### The Supply of Aero Engines.

It was announced on April 13th that Mr. Alan E. L.

Chorlton, C.B.E., has been appointed Assistant Controller of the Department of Aircraft Production, to deal with the supply and production of aero engines, excluding Rolls-Royce engines.

#### Senior Officers in the R.A.F.

It is announced by the Press Bureau that, owing to the peculiar circumstances in which the Royal Air Force has been formed while active operations are in progress, the number of senior officers in the Force has been found insufficient to provide for the administration and command of the large forces at home which have been transferred from the Navy and Army. Certain officers of high rank have therefore been temporarily lent to the Air Force by the Admiralty and Army Council to carry out these duties.

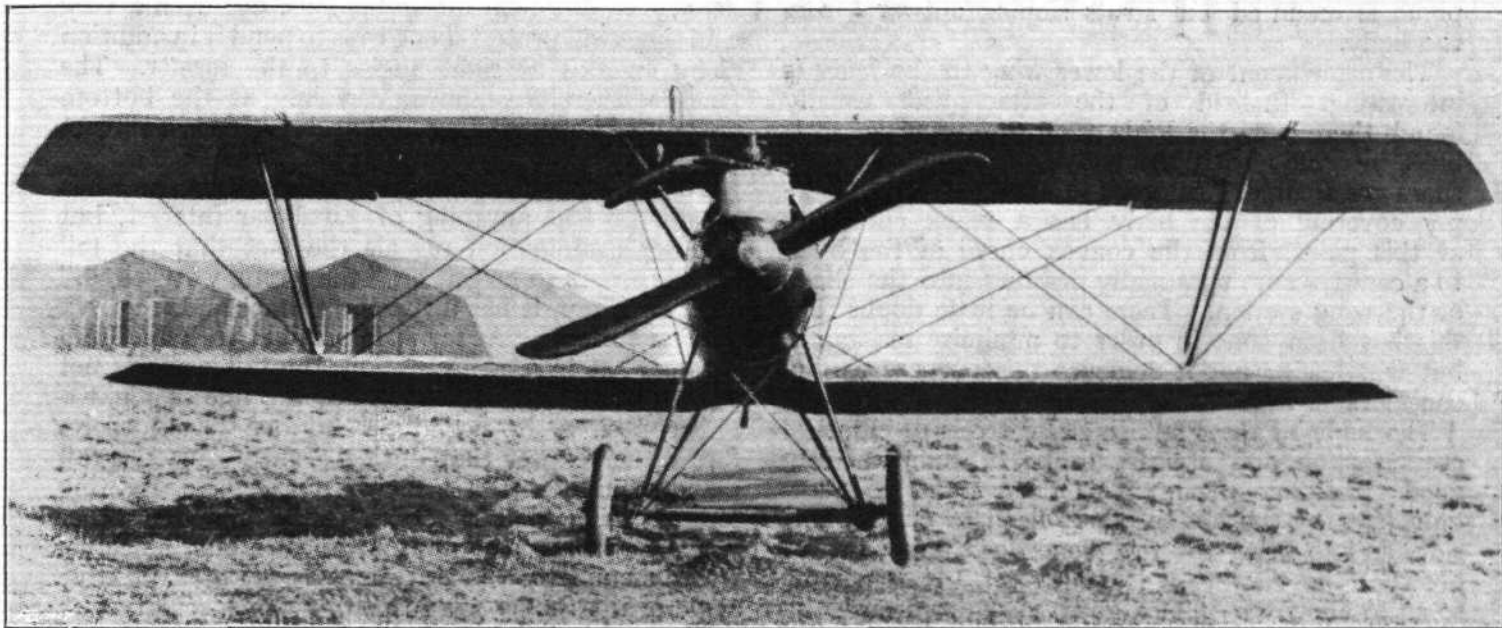


## THE PFALZ SINGLE-SEATER FIGHTER.

AMONG the more recent German single-seater fighters there is one which up to the present has been little known to the general public, although it is, as far as we have been able to ascertain, employed to a considerable extent by the enemy and by no means unknown to our pilots at the front. We are referring

be helpful for purposes of identification we are referring to it briefly in this issue.

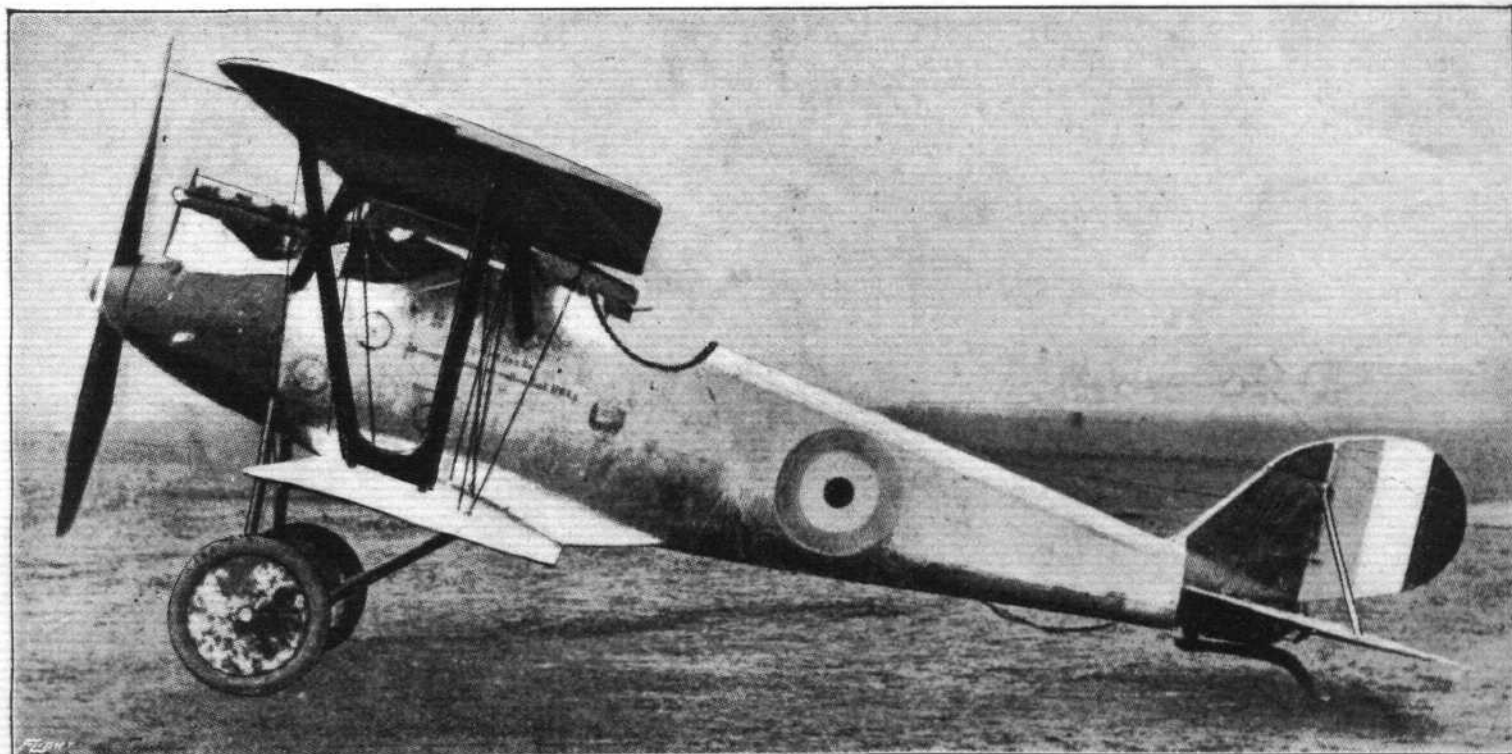
In outward appearance the Pfalz scout is chiefly remarkable on account of the fact that it imitates, as do the recent Albatros scouts, the wing bracing originated by the Nieuport firm, incorporating



Front view of the Pfalz single-seater fighter, 160 h.p. Mercedes engine.

to the Pfalz scout, of which we are able to publish this week, by the courtesy of the authorities, three photographs and a few brief particulars. Several of these machines have fallen into our hands, and later on we hope to refer to this interesting machine in more detail than is possible this week. The preparation of the necessary drawings and sketches takes a considerable time, but so as to lose no time in placing before our readers illustrations which may

a larger top plane and a smaller lower plane. The type is frequently termed by the Germans a one-and-a-half plane. The wing bracing differs, as regards the inter-plane struts, from that of the later type Albatros single-seaters in that the lower ends of the struts do not meet at a point, but are connected by a short horizontal member. The lower plane has two spars according to usual practice, although these are placed rather close together, thus forming



Side view of the Pfalz single-seater fighter, 160 h.p. Mercedes engine.

in reality a compromise between the single-spar lower plane of small chord and the ordinary two-spar lower plane with chord equal to that of the top plane.

The Pfalz follows Albatros practice in that the upper wing runs right through, and is in one piece. This construction is possible on account of the fact that no dihedral angle is given to the wings. The top plane is mounted on struts sloping outward from the body.

The attachment of the lower wing to the body is interesting. Instead of the attachment usually found there is on the Pfalz scout a short wing root, built integrally with the body, to which the lower spars are secured. In order to attain this the three-ply covering of the body has a reflex curvature at this point, from the convex curve of the body to a concave curve gradually merging into the shape of the wing section. There can be little doubt that this has been done in order to minimise resistance, but whether or not it achieves this purpose to any considerable degree may perhaps be open to doubt.

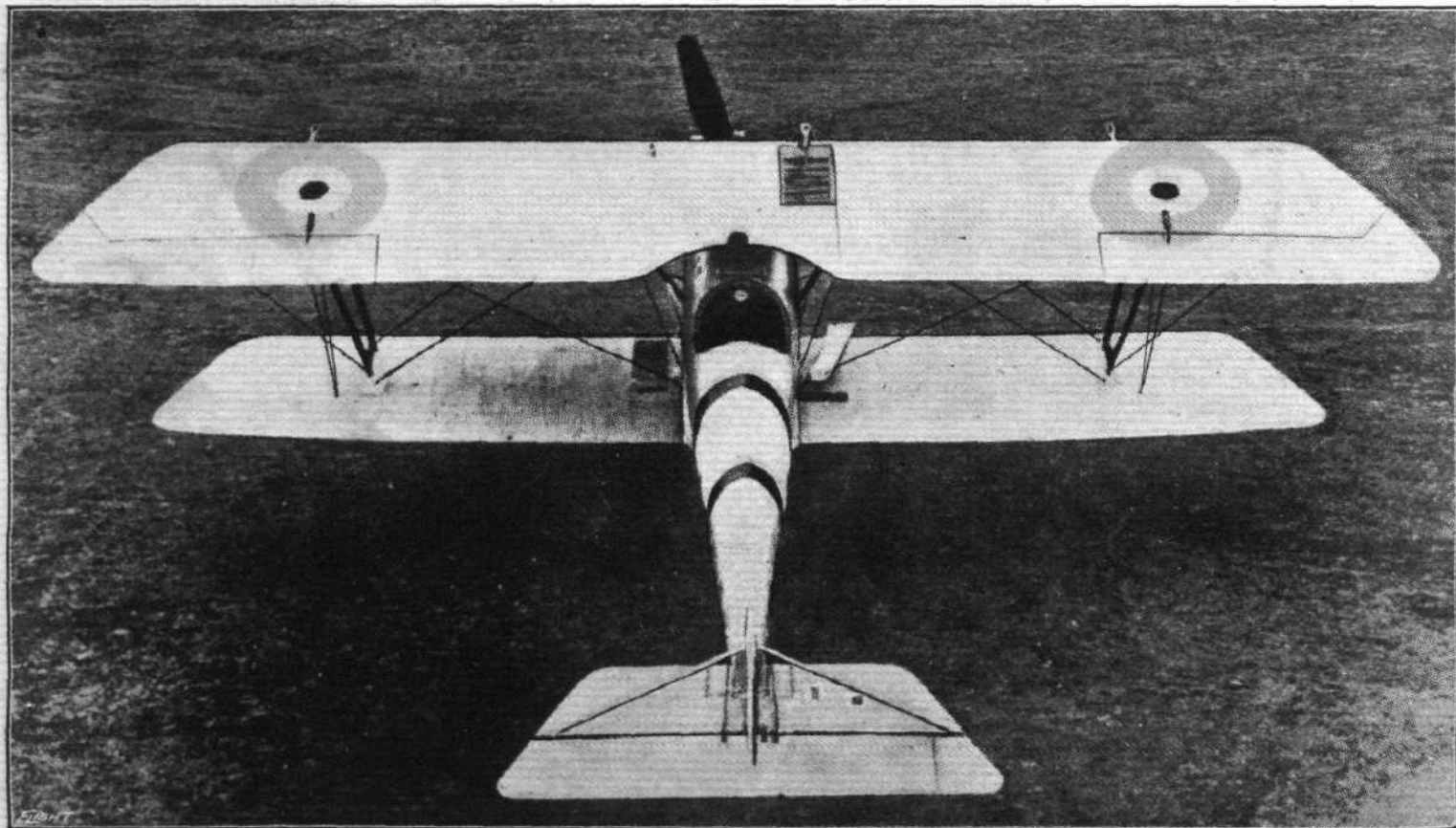
The body of the Pfalz single-seater is of elliptical cross section and appears to be of comparatively good streamline form. It is deep so as to allow only just the top of the pilot's head to project outside, and to bring the top plane down low so as to obstruct the view to a lesser extent. It is narrow so as to allow the pilot a good view downward, the narrow overall width being rendered possible by the adoption of the semi-monocoque construction.

Although being in general principle similar to the Albatros construction the body of the Pfalz differs somewhat in the manner of applying the ply-wood covering. Whereas that of the Albatros is put on in short rectangular sections, each covering only one span between adjacent body formers, the covering

of the Pfalz is in the form of two thicknesses of three-ply, each in the form of long narrow strips put on diagonally, the strips of the inner skin and those of the outer running at approximately right angles to one another. It would appear that this form of construction is of some advantage, inasmuch as difficulty is always experienced in getting three-ply wood to bend to a double curvature. A sheet of three-ply may be readily bent along one axis, but even a very thin sheet will protest if one tries to bend it in addition along an axis at right angles to the former. The fact is, therefore, almost certainly at the bottom of the Pfalz construction. However, this is a subject to which we hope to return later.

To the casual observer the tail planes of the Pfalz do not present anything of particular interest, but a closer examination reveals the fact that the tail plane appears to be put on "the wrong way round." That is to say, it has a flat top surface and a convex bottom surface. As far as is possible to judge from a somewhat hurried inspection, the tail plane is not set at any angle of incidence to the line of flight—either positive or negative—and one would therefore rather expect that during a steep dive the tail plane would exert a somewhat excessive righting force tending to "flatten out" the machine rather abruptly. This is so unusual in a German machine, where frequently the tail plane is set at a positive angle of lift, as to give food for some speculation.

The engine fitted to the Pfalz scout in question is a 160 h.p. Mercedes, which, as the accompanying photographs show, is neatly covered in with the exception of the extreme top of the cylinders. We have at the moment no figures regarding performance, but in view of the evident low resistance of the body the speed may safely be assumed to be fairly good.



View from above of the Pfalz single-seater fighter, 160 h.p. Mercedes engine.



# THE MODERN AEROPLANE.

By [F. S. BARNWELL, Captain, R.F.C.]

[Owing to extreme pressure on his time Captain F.S. Barnwell, R.F.C., has found it impossible to cover the entire circuit of towns at which he was scheduled to read his paper "The Modern Aeroplane," one of the series of educational lectures arranged by the Aeronautical Society at the request of the Air Board. For the benefit of those thus deprived of the opportunity of hearing Captain Barnwell deliver his lecture, we have arranged to publish his paper. In this manner it is hoped that not only the students who would otherwise have attended this lecture, but also a vast number of others interested in the problems of the aeroplane, may benefit by and derive pleasure from reading this highly interesting paper. Captain Barnwell, who as chief designer to the "Bristol" firm has had long practical experience in the design of aeroplanes, combines a thorough mastery of all the intricate theories of aerodynamics with the rare gift of being able to state these theories in such lucid form, as to enable anyone to grasp the fundamental principles. Further than these he does not, nor, we think, does he claim to, go in the present paper, which, it should be remembered, has been prepared for the benefit of those who have only recently commenced, or are just about to begin, to make a study of this fascinating subject. In these days those of us who have been closely associated with the progress and development of the aeroplane are somewhat apt to forget that there are others who have not had the opportunity, and to whom, therefore, much of what the older hands simply take for granted is incomprehensible. We feel confident that Captain Barnwell's paper will go a long way towards elucidating the fundamental principles underlying the problems of aeroplane design.—ED.]

We shall define an aeroplane as a machine consisting of a rigid body, on which are mounted a petrol motor driving an air screw, one or more pairs of rigid wing surfaces (or aerofoils), vertical and horizontal stabilising and controlling surfaces, and a landing gear structure provided with wheels. (Fig. 1.) Inside this body are seats for the pilot and passenger (if any) and the actuating levers for the various controls. The petrol and oil tanks also are mounted inside or on top of this body.

It is advisable to run over the functions of the various main members of the machine, before proceeding to consider how these have been developed and along what lines one may expect them to be modified in the future.

The obvious function of the engine is to rotate the air screw. The air screw when rotated causes a column of air, usually termed the "slip stream," to be driven off behind it in a direction parallel to its axis. Owing to this there is a reaction of forward thrust, on the blades of the air screw, which tends to give the whole machine a velocity in the direction of this thrust. A forward velocity of the whole aeroplane entails that its rigid wings (or aerofoils) impart a downward trend to the air flowing across them, and this causes a reaction on these aerofoils approximately normal to their surfaces. When the velocity becomes such that the vertical component of this reaction on the aerofoils is greater than the total weight of the machine, the machine will leave the ground. This is a most elementary explanation of "why an aeroplane flies"; I think it justified as a statement of fundamental necessities. Now to consider what I shall call the "flight members," namely, the engine, air screw and aerofoils.

Modern aeroplane engines are still of the two distinctive classes—air-cooled and water-cooled. The air-cooled class contains the "rotary," "stationary radial," and "stationary vee" types; engines of the water-cooled class are all stationary and are of "vertical," "inverted vertical," "radial," "vee," and "horizontal-opposed" types. I do not propose to describe engines at all, further than to quote a few figures for some at present in use.

Of air-cooled rotaries we have the 7-cylinder 80 h.p. "Gnome," weighing about 210 lbs., and giving about 68 b.h.p. at 1,200 r.p.m. This engine is used only in training machines now.

Next, the 90 h.p. 9-cylinder "Le Rhone," weighing about 250 lbs., and giving about 85 b.h.p. at 1,200 r.p.m. This engine is still used on very small single seated war aeroplanes.

Then we have the 100 h.p. 9-cylinder "Monosoupape Gnome," weighing about 280 lbs., and giving about 100 b.h.p. at 1,250 r.p.m.

Finally we have the 110 Clerget, the 130 Clerget and the 110 Le Rhone, all 9-cylinder engines. The 110 Clerget weighs about 370 lbs., and gives about 119 b.h.p.

The petrol consumption of rotary engines is about .75 lb. per b.h.p. hour, and their oil consumption about .14 lb. per b.h.p. hour. Their revolutions for maximum power at the air screw are between 1,250 and 1,350 per minute.

Of the stationary radial air-cooled type we have various Anzani and others. The Anzani are used in some training machines; I believe their power per lb. weight is too poor for war machines. We should note in passing that the radial type should give us a light engine, but it must also give

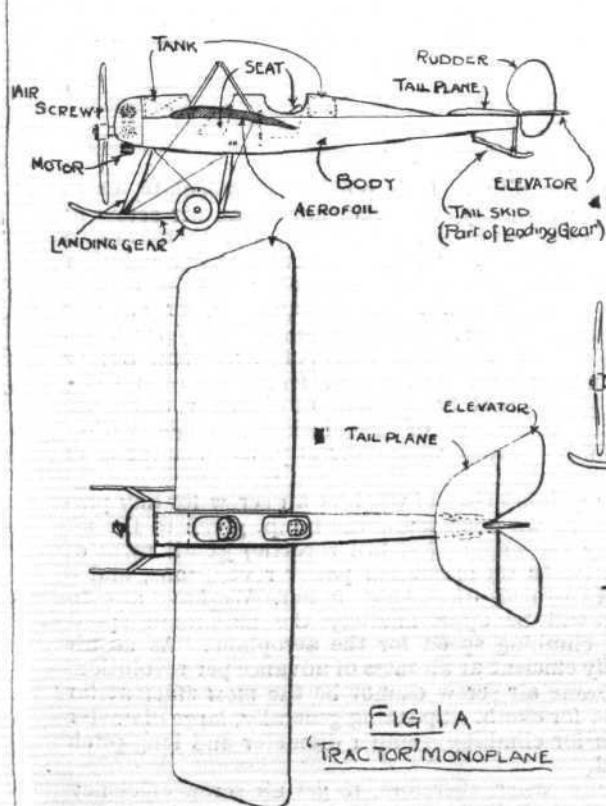


FIG. 1A

'TRACTOR' MONOPLANE

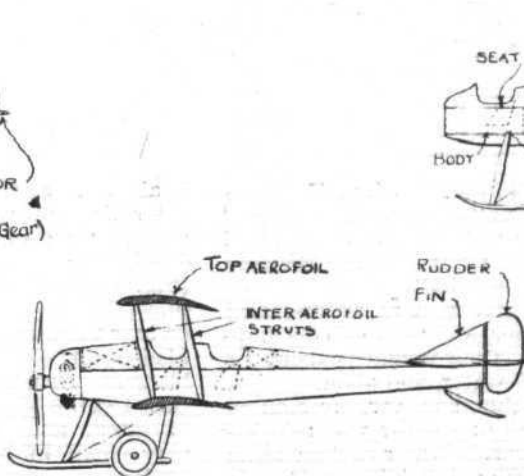


FIG. 1B

'TRACTOR' BIPLANE.

Top Plan approximately same as for Tractor Monoplane.

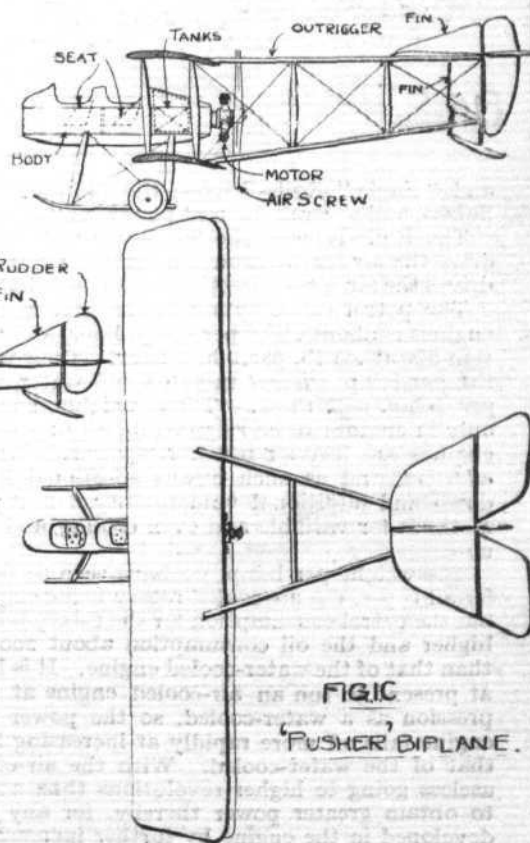


FIG. 1C

'PUSHER' BIPLANE.

us an engine of large diameter, and therefore probably of high head resistance. These features are common of course to stationary radials and to rotaries.

Of the stationary air-cooled Vee type we have the 70 h.p. Renault, an 8-cylinder engine, weighing about 360 lbs. and giving about 72 b.h.p. at 1,800 r.p.m.; this engine is still used on training machines. It is heavy, but reliable and long suffering. The 8-cylinder R.A.F. 1A weighs about the same as the Renault, and gives about 95 b.h.p. at 1,800 r.p.m. The 12-cylinder R.A.F. 4A weighs about 650 lbs., and gives about 140 b.h.p. at 1,800 r.p.m. All these air-cooled Vee engines have the air screw mounted on an extension of the cam shaft, and that is to say the air screw revolutions are only one half engine revolutions; this I consider a disadvantage for fast and light machines.

Of vertical water-cooled types we have the 160 h.p. 6-cylinder Beardmore; it weighs about 570 lbs., and gives about 170 b.h.p. at 1,400 r.p.m.

Of the inverted vertical and the horizontal opposed types there are no models as yet in service, but there may be soon. Both types possess great advantages from the aeroplane designer's point of view. These are:—very small bulk of engine above the air screw shaft to obstruct the view, low carburettor position (making for greater ease in employing a gravity petrol feed from the main fuel tanks), and the possibility of using short and simple pipes to carry the exhaust gases underneath the body of the aeroplane.

Of Vee type water-cooled engines we have the "Falcon"

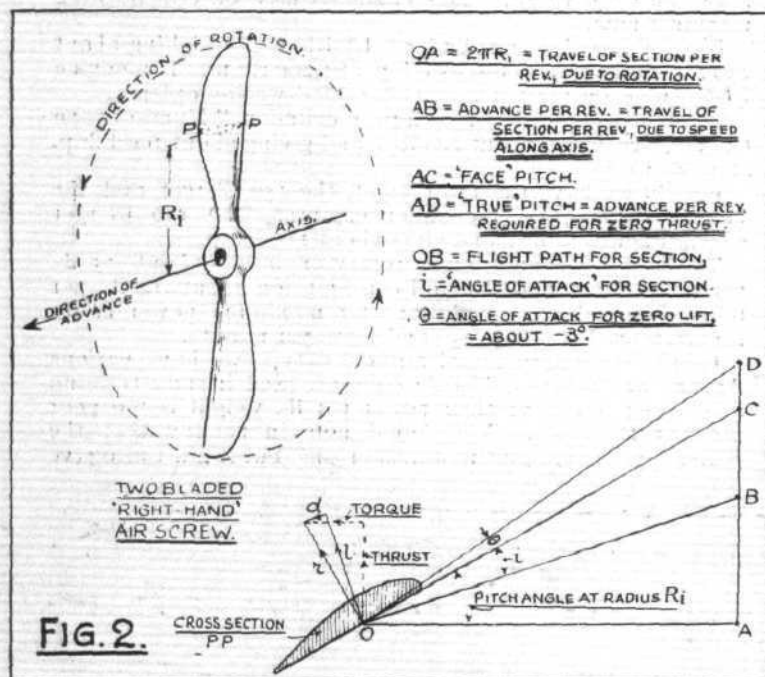


FIG. 2.

and "Eagle" Rolls-Royces, the 140 and 200 h.p. Hispano-Suizas, and several different powers of "Sunbeam-Coatalens."

The Rolls-Royces, the Sunbeams and the 200 Hispano all drive the air screw through a reduction gear; the 140 Hispano drives the air screw directly on the crankshaft.

The petrol consumption of the best modern water-cooled engines is about .5 lb. per b.h.p. hour, and their oil consumption about .04 lb. per b.h.p. hour. Their weight is about 2.8 lbs. per b.h.p. without radiator and water, and about 3.4 lbs. per b.h.p. with these. These weights, however, are realised only in engines of over 150 b.h.p., say: smaller water-cooled engines are heavier per horse-power. Water-cooling is an addition, and as such means additional liability to breakdown and additional vulnerability, but it permits of simple methods for variable and even cooling, and this is a necessity now.

The weight per b.h.p. we have seen to be much the same for all types, the air-cooled rotary being slightly the lightest; but the petrol consumption for the rotary is about 50 per cent. higher and the oil consumption about 200 per cent. higher than that of the water-cooled engine. It is hardly practicable at present to run an air-cooled engine at such a high compression as a water-cooled, so the power of the air-cooled engine falls off more rapidly at increasing heights than does that of the water-cooled. With the air-cooled rotary, it is useless going to higher revolutions than about 1,300, trying to obtain greater power thereby, for any additional power developed in the engine by further increasing its revolutions will not be available at the air screw, it will be more than

accounted for by the additional power thereby absorbed by the rotating cylinders, &c.

Roughly then for powers of below 150 b.h.p. we usually employ an air-cooled rotary, for powers above this a water-cooled stationary.

Now for the air-screw (Fig. 2). A well-designed air screw on a fast aeroplane is a very highly efficient source of thrust; it can transform, under good conditions, over 80 per cent. of the b.h.p. of the engine into "thrust horse-power." I make this initial statement, because many people seem to think otherwise, judging from the extraordinary forms of propulsion patented or otherwise advocated.

I shall not define the technical terms connected with air screws, nor give reasons for my statements, but shall merely make a few general statements of their properties.

### First for efficiency.

We shall define the efficiency of an air screw as the fractional value—work done by air screw divided by work given to air screw. If we denote the thrust in lbs. by  $T$ , and the "advance" (or speed along the line of this thrust) in feet per second by  $S$ , then the work done by the air screw is  $T \times S$  thrust horse-power. This value divided by the

500 b.h.p. which the engine driving the air screw is developing, gives us the "efficiency" of the air screw. The "efficiency" quoted hereafter always means this only. If the air screw be stationary along its line of thrust, it is doing no work in the sense just defined, so its "efficiency" is zero, although it is giving a thrust. Directly it begins to "advance" it commences to do work and to possess therefore an efficiency.

For any air screw therefore the efficiency varies according to the rate of its advance per revolution. The maximum efficiency usually occurs when the advance per revolution

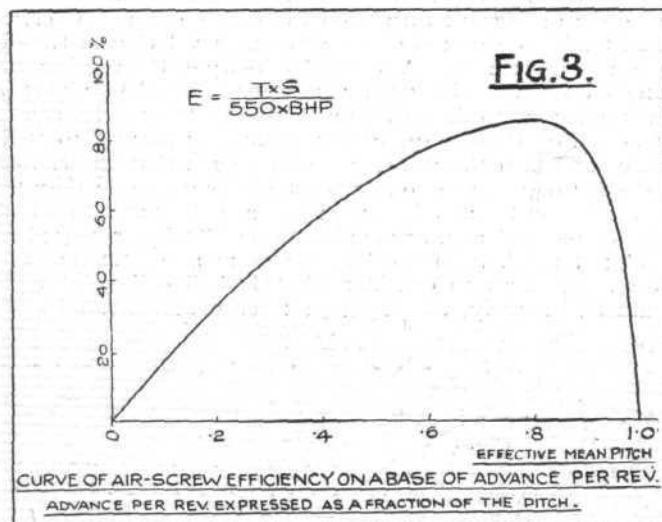


FIG. 3.

CURVE OF AIR-SCREW EFFICIENCY ON A BASE OF ADVANCE PER REV. ADVANCE PER REV. EXPRESSED AS A FRACTION OF THE PITCH.

is about .8 of the pitch. It is possible to calculate, or to determine experimentally, the efficiency of an air screw at various rates of advance per revolution, and therefrom to draw a curve of efficiency on a base of advance per revolution (Fig. 3). The most efficient form of air screw as regards pitch, is one whose pitch is about equal to, or slightly greater than, its diameter. For the same blade form a two bladed air screw is somewhat more efficient than a four bladed. Assuming that only one factor varies at a time, thrust varies approximately as square of diameter, as square of pitch, and as square of revolutions; while within very small limits thrust varies directly as face area of blades.

When the question arises of the best air screw for any particular aeroplane, we must know the b.h.p. given to the air screw shaft by the engine (on full throttle) at all rates of revolutions between its maximum power revolutions, and a rate of, say, two-thirds of this maximum. We have also to assume what will be approximately the maximum speed and the best climbing speed for the aeroplane. As no air screw is equally efficient at all rates of advance per revolution, one and the same air screw cannot be the most efficient for high speed and for climb. Speaking generally, large diameter and fine pitch for climbing, smaller diameter and long pitch for high speed.

It is generally easier, therefore, to get air screw efficiency at high speed than at climbing speed, for the pitch of the most efficient high-speed air screw will be greater in proportion to its diameter than will that of the most efficient climb-



speed. We usually employ an air screw whose maximum efficiency is at some speed between climb-speed and high-speed, trying thereby to obtain the best compromise. One fact which slightly extends the range of the air screw efficiency is that the faster an aeroplane advances, the higher does its engine revolutions speed become; so that the advance per revolution does not vary so greatly (nor therefore the air

screw efficiency) between the climb-speed and high-speed, as it would if the revolutions remained constant. Best climbing-speed is generally about 60 per cent. of the high-speed, for fast modern machines, and probably the best all-round air screw is one designed for maximum efficiency at a speed of about 90 per cent. of the high-speed.

(To be continued.)

## HONOURS.

### Awards for Capture of Jerusalem.

It was announced in a supplement to the *London Gazette* on April 11th that the King has been pleased to approve of the following rewards for distinguished services in the Field in connection with military operations, culminating in the capture of Jerusalem, dated January 1st, 1918:—

#### *Distinguished Service Order.*

Capt. (Temp. Lieut.-Col.) A. Shekleton, R. Muns. Fus., and R.F.C.

#### *Military Cross.*

Lieut. (Temp. Major) V. A. Beaufort, Devon and R.F.C.  
Temp. Capt. G. R. A. Deacon, R.F.C.  
Temp. 2nd Lieut. A. Hopkins, B.W.I. Regt. and R.F.C.  
Temp. Lieut. J. Kirk, R. Highrs. and R.F.C.  
Temp. Lieut. D. R. Mackie, R.E. and R.F.C.  
2nd Lieut. H. L. C. McConnell, Ind. A. R. of O. and R.F.C.  
Temp. 2nd Lieut. J. H. Maingot, B.W.I. Regt. and R.F.C.  
Capt. I. P. H. Preston, Gen. List and R.F.C.  
Lieut. A. H. St. Clair, Arg. and Suth. Highrs. and R.F.C.  
Capt. T. G. Thornton, York Regt. and R.F.C.  
Capt. F. E. Williams, Welsh Regt. and R.F.C.  
Lieut. (Temp. Capt.) G. H. B. Wilson, Gen. List and R.F.C.  
Lieut. C. le B. Brown, Aus. F.C.  
Lieut. W. A. Coates, Aus. F.C.  
Lieut. H. L. Fraser, Aus. F.C.  
Lieut. O. M. Lee, Aus. F.C.

#### *Meritorious Service Medal.*

No. 403988 (frmly. 51031) 1st Air-Mech. (A. Corpl.) H. Anthony, R.F.C.  
3206 Sergt. Major W. A. Bradwell, R.F.C.  
1669 Flight-Sergt. C. W. Etheridge, R.F.C.  
403891 (frmly. 50948) Sergt. T. Evans, R.F.C.  
3090 Flight Sergt. C. C. Gissing, R.F.C.  
1221 Flight Sergt. W. J. F. Golding, R.F.C.  
9029 Flight Sergt. F. S. Hall, R.F.C.  
3552 Flight Sergt. J. S. Hunt, R.F.C.  
4256 Sergt. Major T. J. Huxter, R.F.C.  
11895 Sergt. A. L. Payne, R.F.C.  
404005 (frmly. 51204) Corpl. C. H. Phillips, R.F.C.  
3030 Sergt. F. W. Pound, R.F.C.  
403905 (frmly. 65382) 1st Air-Mech. J. Rankin, R.F.C.  
1527 Flight-Sergt. F. O. Walker, R.F.C.  
7643 Corpl. F. E. Wilson, R.F.C.  
Aus. 108 Sergt. W. A. Beard, Aus. F.C.  
Aus. 455 Acting Sergt. O. H. Coulson, Aus. F.C.  
Aus. 124 Acting Flight-Sergt. J. H. Rogers, Aus. F.C.  
Aus. 320 Flight Sergt. H. L. Sleeman, Aus. F.C.  
Aus. 104 Flight Sergt. T. Watkins, Aus. F.C.



### The R.F.C. on Indian N.-W. Frontier.

IN the despatch from Lieut.-Gen. Sir A. A. Barrett, K.C.B., K.C.S.I., K.C.V.O., on the operations against the Mahands, March-August, 1917, there are the following references to the work of the R.F.C.:—

"On June 21st, Major-General Beynon ordered the 45th Brigade to destroy the village of Nanu, at the head of the Splitoi Valley, whilst the 43rd Brigade dealt with the settlements in the vicinity of Ispana Raghza. The enemy had evidently determined to make a stand on this occasion, and aeroplanes reported considerable bodies of the enemy on the ridge dividing the Splitoi and Shahur Valleys, through which ran the pass to Nanu."

"Major-General Beynon brings to notice the most creditable manner in which the Mahindradal Regiment carried the heights forming its objective and also the valuable work performed by the aeroplanes of the 31st Squadron, Royal Flying Corps, both in reconnaissance and in bombing the enemy."

"Whilst these operations were taking place several raids were carried out by aeroplanes of the 31st Squadron, Royal Flying Corps. Shingai villages in the Takhi Zam and others in the Badda Toi were bombed and in a particularly success-

### Belgian Honours for the R.F.C.

It was announced in a supplement to the *London Gazette* on April 15th that the following decorations and medals have been conferred by the King of the Belgians for distinguished services rendered during the course of the campaign.

#### *Order of Leopold.*

##### *Officer.*

Bt. Col. (Temp. Brig.-Gen.) T. I. Webb-Bowen, C.M.G., Bedford Regiment.

#### *Order of Leopold II.*

##### *Chevalier.*

49181 Sergt. A. R. H. Bathurst, R.F.C.  
190 Temp. Sergt. Major F. Dismore, R.F.C.

#### *Decoration Militaire.*

37208 Corpl. A. W. Daniells, R.F.C.  
12515 1st Air-Mech. A. Langstaffe, R.F.C.

#### *Croix de Guerre.*

Temp. Lieut. (Temp. Capt.) C. B. Baker, O. and B. L. I. and R.F.C., Temp. Capt. K. F. Balmain, R.F.C., 2nd Lieut. W. D. Bostock, R.F.C. (S.R.), Temp. Capt. W. P. MacD. Brettell, R.F.C., Temp. Lieut. L. D. Brown, R.F.C., Major A. D. Carter, D.S.O., New Bruns. Regt. and R.F.C., Capt. (Temp. Major) J. A. Cunningham, R.F.A. and R.F.C., Capt. E. A. Fawcus, Newfoundland F. and R.F.C., Temp. 2nd Lieut. C. R. H. Ffolliott, Linc. and R.F.C., Temp. 2nd Lieut. R. Harris, R.F.C., Capt. (Temp. Major) M. K. Horn, M.C., R.F.C. (S.R.), Lieut. (Temp. Capt.) R. H. Jarvis, M.C., R.F.C. (S.R.), Temp. Capt. G. Knight, M.C., R.F.C., Lieut. (Temp. Capt.) J. McKelvie, R.E. and R.F.C., Temp. 2nd Lieut. W. F. Mayoso, R.F.C., Temp. Capt. A. D. Pearce, R.F.C., Lieut. R. C. Purvis, W. Riding and R.F.C., Temp. 2nd Lieut. R. W. Rose, R.F.C., Temp. Capt. R. L. Stevenson, R.F.C., Temp. 2nd Lieut. R. M. Strang, R.F.C., Temp. Capt. G. M. Turnbull, R.F.C., Major H. S. Walker, Ches. and R.F.C., Temp. 2nd Lieut. W. Walker, R.F.C., Bt. Lieut.-Col. (Temp. Brig.-Gen.) T. I. Webb-Bowen, C.M.G., Bedf. Regt.

43958 1st Air-Mech. L. F. Bolton, R.F.C., 10551 Corpl. E. Bradshaw, R.F.C., 88059 2nd Air-Mech. F. Broscumb, R.F.C., 15422 1st Air-Mech. B. Brown, R.F.C., 23843 Sergt. G. Chattington, R.F.C., 65384 1st Air-Mech. F. P. Clarke, R.F.C., 3497 Corpl. W. J. Collett, R.F.C., 8015 Corpl. W. Cox, R.F.C., 8545 1st Air-Mech. C. A. Davey, R.F.C., 16342 Sergt. E. A. Gay, R.F.C.

### M.M. for the R.F.C.

It was announced in a supplement to the *London Gazette* issued on April 10th that the King has been pleased to approve of the award of the Military Medal for Bravery in the Field to the following:—

J. 1403944 2nd Air-Mech. F. J. Knowles, R.F.C.

ful raid on 26th June nine hits were scored on Makin and six on Marobi, the home of Mulla Fazl Din, the titular chief of the tribe. These raids involved considerable risks. Engines were very liable to failure in the high temperature prevailing; distances from the base at Tank were long, and hills up to 8,000 feet had to be crossed. These risks were, however, cheerfully taken by the flying officers and were well repaid by the results obtained, which undoubtedly contributed largely to the general desire for peace displayed by all sections of the tribe."

### R.A.F. Officers and Courts-Martial.

A REGULATION made by the Air Council states that in the case of an officer transferred from the naval or military forces to the Air Force the time during which he has held a commission in the force from which he is transferred shall, for the purpose of qualifying such an officer as president or member of a Court-martial, be aggregated with the time during which he has held a commission in the Air Force.

### Billeting the R.A.F.

By an Order of the Air Minister, general and field officers of the Royal Air Force are empowered to issue billeting requisitions.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Monday, the 15th inst., when there were present: Brigadier-General Sir Capel Holden, K.C.B., F.R.S., in the Chair, Lieut.-Col. J. T. C. Moore-Brabazon, R.A.F., Mr. Ernest C. Bucknall, Mr. G. B. Cockburn and Lieut.-Col. Alec Ogilvie, R.A.F. Lieut.-Com. H. E. Perrin, R.N.V.R., in attendance.

**Election of Chairman and Vice-Chairman.**—Brigadier-General the Duke of Atholl, M.V.O., D.S.O., was elected Chairman of the Club, and Brigadier-General Sir Capel Holden, K.C.B., F.R.S., was elected Vice-Chairman of the Club.

**Election of Stewards.**—The Stewards of the Club were elected as follows:—

The Earl of Lonsdale.

Admiral the Hon. Sir Edward H. Seymour, P.C., G.C.B., O.M., G.C.V.O.

Hon. Arthur Stanley, M.V.O., M.P.

Sir Charles S. Henry, Bart., M.P.

Lieut.-Gen. Sir David Henderson, K.C.B., D.S.O.

Prof. Sir John H. Biles, LL.D., D.Sc.

**Sub-Committees.**—The following Sub-Committees were appointed:—

### House Committee.

Mr. Ernest C. Bucknall.

Capt. R. L. Charteris, R.A.F.

Surgeon Herbert J. Corin, R.N.V.R.

Mr. C. G. Greenhill.

Mr. Henry Knox.

Mr. J. Stewart Mallam.

Mr. J. H. Nicholson.

Mr. Gavin W. Ralston.

Mr. J. H. Spottiswoode.

### Finance Committee.

Lieut.-Col. J. T. C. Moore-Brabazon, R.A.F.

Mr. Ernest C. Bucknall.

Mr. G. B. Cockburn.

Mr. J. H. Nicholson.

Lieut.-Col. Alec Ogilvie, R.A.F.

Mr. T. O. M. Sopwith.

**Election of Members.**—The following New Members were elected:—

Staff-Surgeon Henry Cooper, R.N.

Lieut. Sydney Crossley.

2nd Lieut. Alan Harper Curtis, R.A.F.

Lieut. Frederic Ambrose George, R.A.F.

Flight Com. Henry Seymour Neville, R.N.

Squad. Com. Reginald Eycott Nicoll, R.N.

Lieut. Vyvian Neville Peel (Argyll and Sutherland Highlanders).

Lieut. Philip Gilbert Robinson, R.A.F.

2nd Lieut. Denis Ewart Bernard Kingston Shipwright, R.A.F.

Lieut. Paris Graham Singer, R.N.

Capt. Tilden Christmas Thomson, R.A.F.

Capt. Lewis Augustus Walker, R.A.M.C.

Capt. Anthony Herbert William Wall, M.C., R.A.F.

2nd Lieut. Franklin Stanley Willsie, R.A.F.

**Temporary Honorary Members.**—The following were elected Honorary Members of the Club for a period of one month:—

Ensign Samuel Carlyle Hawkins (U.S. Navy, R.F.C.).

2nd Lieut. Herbert Carl Huebner.

Lieut. Maurice MacGregor Kidd (U.S. Aviation Corps).

Lieut. George Vaughn Seibold.

Ensign Eugene Luce Van Houten (U.S. Navy, R.F.C.).

2nd Lieut. Clive Wilson Warman, D.S.O., M.C.

## THE FLYING SERVICES FUND

administered by

### THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps, who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W.1.

### Subscriptions.

	£	s.	d.
Total subscriptions received to April 9th, 1918	12,692	18	0
The Standard Aircraft Manufacturing Co., Ltd.	26	5	0

Total, April 16th, 1918

12,719 3 0

H. E. PERRIN, Secretary.

3, Clifford Street, New Bond Street, W. 1.

## THE ROLL OF HONOUR.

### REPORTED by the Admiralty:—

#### Killed.

J26402 Act. Air-Mech., 1st Gr., H. G. Lovelock, D.S.M., R.N.A.S.

#### Accidentally Killed.

F17153 Aircraftman., 1st Cl., E. W. Johnson, R.N.A.S.

F31588 Aircraftman., 1st Cl., G. W. Prior, R.N.A.S.

### Reported by the War Office:—

#### Killed.

Lieut. P. S. Driver, A.S.C., attd. R.F.C.

2nd Lieut. H. Fitzgibbon, R.F.C.

2nd Lieut. J. A. Miller, R.F.C.

2nd Lieut. W. J. Ramsay, R. Welsh Fusiliers, attd. R.F.C.

2nd Lieut. L. L. J. Sell, Aus. F.C.

2nd Lieut. R. D. Turnell, R.F.C.

68085 2nd Air-Mech. W. Cockburn, R.F.C.

2042 Flight Sergt. T. Green, R.F.C.

32573 1st Air-Mech. F. Lem, R.F.C.

402870 Corpl. A. McLeod, R.F.C.

#### Previously Missing, now reported Killed.

2nd Lieut. G. Cowie, R.F.C.

2nd Lieut. R. P. Pohlmann, R.F.C.

2nd Lieut. B. Starfield, R.F.C.

#### Previously Missing, now reported by German

#### Government Killed or Died of Wounds.

14956 Act. Corpl. A. Beebe, R.F.C.

#### Died of Wounds.

2nd Lieut. H. J. R. Finemore, Suss., attd. R.F.C.

Capt. D. D. G. Hall, M.C., R.F.C. (Lieut., Yorks.).

### Accidentally Killed.

Lieut. J. B. Richards, Brit. Col., attd. R.F.C.

#### Died.

2450 Flight Sergt. A. E. Evans, R.F.C.

22887 Flight Sergt. A. J. Hutchings, R.F.C.

35303 1st Air-Mech. G. S. King, R.F.C.

96377 3rd Air-Mech. J. H. Wood, R.F.C.

#### Wounded.

2nd Lieut. H. N. Arthur, R.F.C.

Capt. M. F. Bridge, A.S.C., attd. R.F.C.

Lieut. C. T. Brown, Aus. F.C.

Lieut. J. V. R. Brown, Argyll and Sutherland Highrs., attd. R.F.C.

Lieut. B. S. Cole, R.F.C.

Capt. W. Deane, Norf., attd. R.F.C.

Lieut. J. S. Dunkerley, R.F.C.

2nd Lieut. H. E. Easton, London, attd. R.F.C.

2nd Lieut. H. H. Harman, R. Fus., attd. R.F.C.

2nd Lieut. A. R. Harrison, W. Yorks., attd. R.F.C.

2nd Lieut. R. S. Herring, London, attd. R.F.C.

Lieut. F. D. Howitt, A.S.C., attd. R.F.C.

Lieut. F. W. Irving, Lancs. Fus., attd. R.F.C.

Lieut. J. P. Jeffers, Aust. F.C.

2nd Lieut. D. H. Jones, R.F.C.

Lieut. G. H. Kindred, Aust. F.C.

2nd Lieut. A. Kock, R.F.C.

Lieut. R. D. Leigh-Pemberton, G. Gds., attd. R.F.C.

2nd Lieut. R. E. Lindsay, R.F.C.

Lieut. J. B. Martin, Brit. Col., attd. R.F.C.

2nd Lieut. J. Mitchell, Sco. Rif., attd. R.F.C.

Lieut. R. M. Montgomery, R.F.A., attd. R.F.C.



2nd Lieut. M. S. Pettitt, R.F.C.  
 2nd Lieut. S. H. Pickles, R.F.C.  
 Capt. F. G. Quigley, M.C., R.F.C.  
 Lieut. H. E. Rosborough, Can. For. Corps., attd. R.F.C.  
 2nd Lieut. H. E. Stewart, R.F.C.  
 2nd Lieut. S. W. Symons, R.F.C.  
 Lieut. J. Wedgwood, R.F.C.  
 Capt. W. L. Wells, Middx., attd. R.F.C.  
 Lieut. R. P. Ziegler, E. Ont., attd. R.F.C.  
 4713 Sergt. H. Eden, R.F.C.  
 21479 1st Air-Mech. S. Egan, R.F.C.  
 113763 Sergt. C. Hagan, R.F.C.  
 36752 2nd Air-Mech. H. Haigh, R.F.C.  
 40752 2nd Air-Mech. E. I. White, R.F.C.

#### Missing.

2nd Lieut. K. Barford, R.F.C.  
 2nd Lieut. E. J. Blyth, R.F.C.  
 2nd Lieut. T. H. Buswell, R.F.C.  
 Capt. E. B. Cahusac, M.C., R.F.C. (Lieut. South Staffs.).  
 Capt. H. R. Child, R.F.C.  
 2nd Lieut. A. McN. Denovan, R.F.C.  
 2nd Lieut. G. Gornall, R.F.C.  
 2nd Lieut. F. W. Hamsby, R.F.C.  
 2nd Lieut. G. H. Harding, R.F.C.  
 Capt. J. H. Hedley, R.F.C.  
 Lieut. A. Hollis, Hamp., attd. R.F.C.  
 Capt. R. W. Howard, M.C., Aust. F.C.  
 2nd Lieut. R. D. Kennedy, R.F.C.  
 Capt. K. R. Kirkman, R.F.C.

2nd Lieut. M. Leggatt, Lanc. F., attd. R.F.C.  
 2nd Lieut. W. S. Maxwell, R.F.C.  
 Lieut. J. D. Moses, Manlt., attd. R.F.C.  
 Lieut. F. A. W. Nunn, London, attd. R.F.C.  
 2nd Lieut. C. G. Pentecost, R.F.C.  
 2nd Lieut. E. W. Pickford, R.F.C.  
 2nd Lieut. H. W. Ransom, R.F.C.  
 Lieut. H. S. Redpath, A. and S. Hrs., attd. R.F.C.  
 Lieut. O. Rentoul, Yeo., attd. R.F.C.  
 2nd Lieut. T. F. Rigby, R.F.C.  
 Lieut. W. T. Saidler, R.G.A., attd. R.F.C.  
 2nd Lieut. E. T. Smart, R.G.A., attd. R.F.C.  
 2nd Lieut. R. B. Smith, R.F.C.  
 Capt. T. S. Sharpe, R.F.C. (2nd Lieut., Glouc.).  
 2nd Lieut. R. A. Steel, Rif. Brig., attd. R.F.C.  
 Capt. P. V. Tanner, R.F.C.  
 2nd Lieut. T. Taylor, R.F.C.  
 2nd Lieut. E. S. F. Turner, Leins., attd. R.F.C.  
 2nd Lieut. D. Vaughan, R.F.C.  
 2nd Lieut. T. Watson, R.F.C.  
 2nd Lieut. F. C. B. Wedgwood, M.G.C., attd. R.F.C.  
 Lieut. F. J. Westfield, Manch., attd. R.F.C.  
 Lieut. C. E. Wharram, R.F.C.  
 36287 2nd Air-Mech. J. G. Guyat, R.F.C.  
 75078 Sergt. F. J. Swain, R.F.C.

#### Previously Missing, now reported Prisoners in German hands.

Lieut. H. B. P. Boyce, Sask., attd. R.F.C.  
 Lieut. E. E. Heath, Cent. Ont., attd. R.F.C.

## R.A.F. STAFF ORGANISATION.

LORD ROTHERMERE has addressed the following letter to Colonel Faber, M.P. :—

"April 14th, 1918.

"Dear Colonel Faber,—Regarding your call upon me last week, and your subsequent letter, I wish to assure you that the subjects we discussed are having my most earnest attention.

"It is true that the number of Staff officers in the home organisation of the Flying Service is nearly as great as the number of active airmen on the fighting fronts. It is deplorable, but I am not responsible for the system which engenders such a multiplicity of Staff appointments.

"A swollen organisation always means inefficient administration, but it is to be said for the present system that hastily-improvised arrangements made in war time must always be somewhat cumbersome and will always leave plenty of room for criticism. There is much duplication, and a great many of these most excellent officers are engaged in filling up unnecessary forms and carrying out circumlocutory methods of conducting business.

"Of course, the Hotel Cecil does not lend itself to efficient organisation. It is, as you know, a vast building with a multitude of small rooms. Supervision is difficult, and there is necessarily much interchange of correspondence which could be avoided if the staff were accommodated in a building with a small number of very large rooms. However, I am afraid there is no remedy here, because it is impossible to obtain more serviceable premises.

"Above all things, the Air Force needs a real strategic staff. Almost every move of the enemy on the front brings into existence some new aerial problem which requires instant examination and consideration. A small Strategic Council is now being formed, the members of which will be selected for their knowledge of aerial warfare and for their capacity

to envisage some of the aerial problems which the coming months and years will force to the front.

"I intend that the door shall be thrown wide open for promotion of any and every officer whose merit first from the disciplinary, and then from the flying or technical point of view, entitles him to advancement. The Regular officer must always receive priority of consideration. He is the backbone of the three fighting Services, but after all his claims have been met there should be wide scope for the promotion of Temporary and Special Reserve officers, for in the Air Force these officers comprise more than 90 per cent. of the entire staff. So far not one of them has risen to the rank of Brigadier-General on any of the battle fronts or in the training divisions at home. In regard to staff appointments, I think that in the hurry of getting things done, not sufficient consideration was paid, when selections were being made to the Home staff, to the claims of wounded and incapacitated airmen. In future, when an appointment is to be made, war service will count first.

"There is the other matter we discussed, which is of urgent importance, but which I would rather not further refer to in my letter. I recognise its gravity, and am taking immediate measures. It is a matter which, fortunately, concerns the Home organisation, and is therefore capable of direct handling. It has caused me a great deal of anxiety, and I am fully aware of my profound responsibility. I have received many letters on the subject.

"You may be disappointed with my letter. War, however, is not the time to make charges, and for my part, whatever counsels are urged upon me, I cannot—as in the past, so in the future—act except after the most deliberate consideration, and then only with the most meticulous care.

"Yours faithfully,

"ROTHERMERE."

## "X" AIRCRAFT RAIDS.

In view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

### "X 95" Raid (April 12th-13th).

The Field-Marshal commanding Home Forces has issued the following :—

"April 12th—11.50 p.m.

"Some hostile airships crossed our East coast this evening, and proceeded to attack certain Eastern and Midland districts. One or two of the raiders succeeded in penetrating further inland, where some bombs are reported to have fallen. Further details are not yet available. The raid is still in progress."

"April 13th—12.15 p.m.

"Four airships participated in last night's raid. Two of them penetrated a few miles inland. Of the other two,

one reached the Midlands, and the other nearly reached the North-West Coast. The raiders were travelling at a great height, and showed no inclination to attempt to penetrate defended areas. Most of the bombs were dropped in the open country, and apart from the demolition of four houses at one place the damage so far reported is inconsiderable."

"April 13th.—3.45 p.m.

"The casualties in last night's raid were as follows :—

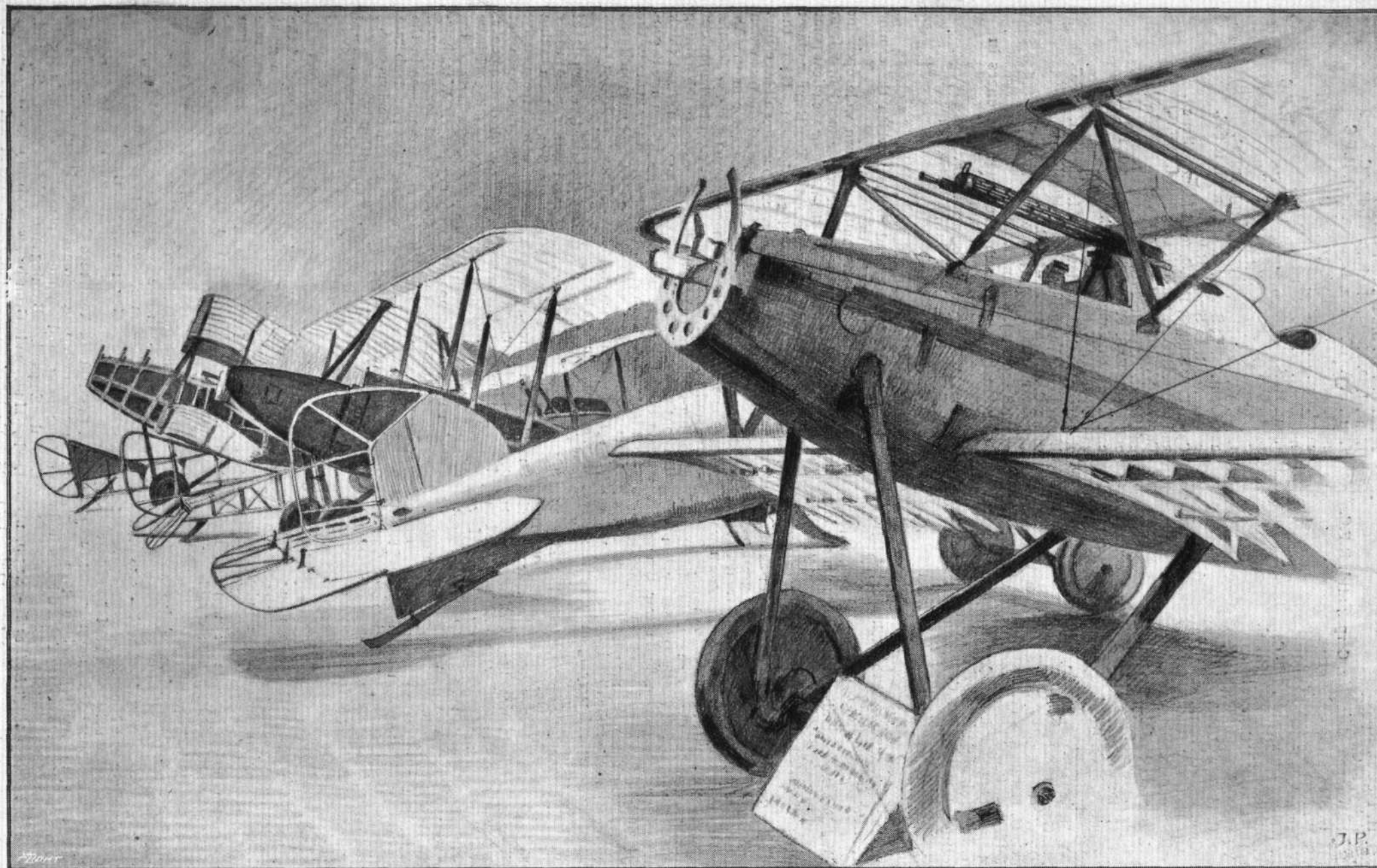
Killed.—2 men, 2 women, 1 child; total 5.

Injured.—8 men, 6 women, 1 child; total, 15."

#### German Version.

"Berlin, April 14th.

"In the night of April 12th Captain Strasser with one of our marine airship squadrons attacked important storage, manufacturing, and shipment places of war industry in Central England. Birmingham, Nottingham, Sheffield, Leeds, Hull, and Grimsby were bombed. Despite the extraordinarily strong gunfire encountered and pursuit by airmen all the airships returned safely."



**AT THE ENEMY AIRCRAFT VIEW ROOMS.**—Although not including all the captured German aeroplanes, this drawing gives a good idea of the excellent arrangement of these trophies, the detail construction of which can be readily inspected owing to the machines being partly stripped as shown. Commencing with the machine in the foreground, the aeroplanes are: Albatros Scout D.V., Albatros Scout D.I., D.F.W.-Aviatik, L.V.G., Albatros Fighter, and Rumpler Fighter. (See also page 425.)



## AN ENEMY AIRCRAFT EXHIBITION.

FROM the number of enquiries which reach us every week it is evident that many of our readers are anxious to avail themselves of the opportunity to examine in detail the captured German aeroplanes and their components now on view at the Enemy Aircraft View Rooms, and it is equally apparent that a great number of our correspondents on this subject are not fully aware of the exact nature of this exhibition, nor of the purpose for which it was arranged. A few notes on the subject may, therefore, be helpful in forming a more clear conception of the *raison d'être* of this highly interesting and instructive War Museum, for such it is virtually, although not in name.

In order to correct from the start any misconception, it may be pointed out that this exhibition is not open to the general public, but only to those directly interested in aircraft, *i.e.*, to members of the Royal Air Force, and to those engaged on the production of aircraft and its components. The former should apply for passes admitting them to the exhibition to D.D.A.T.S., Room 735, Air Ministry, Strand, W.C. 2, and the latter to C.T.D., Central House, Kingsway, W.C. 2.

As regards the exhibition itself this includes a number of complete German aeroplanes, a considerable variety of German aero engines, a series of dissected engines, a great number of accessories such as instruments, bomb gears, and machine guns. In addition there are numerous dissected parts of constructional details of the aeroplanes themselves, from which the different methods of construction are readily ascertained.

Of captured enemy aeroplanes the following are shown complete: Albatros D.V., single-seater, Albatros D.I. single-seater, D.F.W. Aviatik two-seater, L.V.G. two-seater, Albatros two-seater (fully described in "FLIGHT") Halberstadt single-seater and Fokker triplane, both described in "FLIGHT," and the Ago two-seater also described and illustrated in "FLIGHT." These machines are, for the greater part shown with one side covered and the other stripped, thus enabling one to obtain from one point of view a good idea of the general appearance of

the machine, while the other side of the machine allows of inspecting in every detail the construction of the machine.

In another room the exhibits include: a complete 120 h.p. Mercedes, a dissected 120 h.p. Mercedes, a complete 260 h.p. Mercedes, a dissected 260 h.p. Mercedes, a complete 160 h.p. Mercedes, a dissected 160 h.p. Mercedes, a complete 220 h.p. Benz, a dissected 220 h.p. Benz, details of 200 h.p. Argus, a complete 160 h.p. Benz, a dissected 160 h.p. Benz, details of 120 h.p. Argus, complete 120 h.p. Oberursel rotary, and a dissected 120 h.p. Oberursel. Extensive as this list of engines is, it does not by any means complete the exhibits in this room. It would be impossible to give a complete catalogue of all that is to be seen, but the following items may help to give some indication of the variety of subjects which can be inspected: Wings, tail, rudder and fin, chassis parts and numerous minor details of a Gotha bomber. Details of Albatros machines, of Halberstadts, of D.F.W. Aviatiks, of Pfalz biplanes. All manner of instruments are also to be found, such as compasses, altimeters, rev. counters (one of which is very interesting, being of the electric type), etc. By way of armament one finds an interesting collection of machine guns—Parabellums and Spandaus—and several interrupter gears, rifles, and signalling pistols. There are in addition some sections of German tracer bullets and armour piercing tracer bullets, while the manner in which the enemy pilots withstand the effects of cold and altitude is illustrated respectively by a complete aviator's suit and an interesting oxygen apparatus.

The above does not represent by a long way all that is to be seen, but sufficient has, we think, been said to indicate that the collection, which is growing daily, is well worth a visit, and we strongly urge everybody who is entitled to and can possibly do so to pay a visit to the Enemy Aircraft View Rooms, a corner of which we give a sketch on page 424. A few hours spent there will not fail to prove of surpassing interest and of considerable educative value.



### The Output of Aircraft.

ADDRESSING the Bedford Women's Liberal Association on April 11th Mr. F. Kellaway, Parliamentary Secretary to the Ministry of Munitions, said that the increase for the first two months of the year, compared with the first two months of 1917, was as follows: aeroplanes, 223 per cent.; aero-engines, 245 per cent.

The average weekly production of aeroplanes for this year equalled the average production for two months in 1915, while in the case of machine guns one week's production equalled that of five months in 1915.

### Tribunal and R.A.F.

A RESOLUTION, proposed by an A.S.E. member, was passed by the Hammersmith Military Tribunal on April 10th, urging the Government to make immediate enquiries into all munition departments and Royal Air Force depôts as to the capabilities of officers and men serving, and as to the necessity for such officers and men being retained in these depôts.

### French Pilot-Prince Killed.

THE *Petit Journal* says that Flight-Lieut. de Rochecouart-Mortemart, Prince de Tonnay-Charente, who was recently reported as missing, must now be presumed to have been killed.

### Aeroplane Work on Indian N.-W. Frontier.

IN a message from Simla on April 6th, the *Times* correspondent says that the news from the North-West Frontier continues to be satisfactory. Aeroplanes have been effectively used in the operations against the Marris tribe of Baluchistan.

### From Germany to Holland.

THE following officers arrived at Scheveningen from Germany on April 8th:—

Capt. Hunt, R.F.C., Lieut. Heppell, R.F.C., Lieut. Neill, K. Scots., attd. R.F.C., 2nd Lieut. Cook, R.F.C. 2nd Lieut. Leckler, R.F.C., 2nd Lieut. Mitchell, R. Innis. Fus., attd. R.F.C., 2nd Lieut. Ordish, R.F.C., 2nd Lieut. Talbot, R.F.C.

The following arrived on April 10th:—

Flight Lieut. J. M. D'Arcy Levy, R.N.A.S., Capt. P. A. Broder, R.F.C., Lieut. W. M. Crabbie, R.F.A., attd. R.F.C., Lieut.-Commander H. Dobell, R.N.V.R., attd. R.N.A.S., Sub-Lieut. G. H. Dolling-Smith, R.N.A.S., Capt. F. H. Eberli, R.F.C., Lieut. M. W. Greenhow, W. Yorks., attd. R.F.C., Capt. J. C. Leeche, Highrs., attd. R.F.C., Lieut. H. B. Stubbs, R.F.C., Capt. N. C. Spratt, R.F.C., Capt. E. Scholefield, R.F.C., Lieut. W. O. Tudor-Hart, R.F.C., Capt. A. G. Weir, R.F.C.

The following arrived on April 14th:—

2nd Lieut. J. Fairbairn, R.F.C., Lieut. Morrison, R.F.C. (65th Squadron), Capt. C. W. Snook, R.F.C.

### German Aircraft in Holland.

It was reported from Holland on April 12th that a German aeroplane had crossed the frontier of the province of Zeeland and landed its occupants, who are to be interned.

A large German balloon, numbered 57 and marked "Marine Corps," has descended at Barneveld, in the province of Gelderland, Holland.

On Sunday last, a new German battleplane landed near Axel, Zeeland, and the two occupants are to be interned.





AN excellent opening offers for doing a really good turn for those splendid men who, having fought the Empire's battles in the air, have been temporarily placed *hors de combat* as a consequence of their daring deeds against the Hun. In the new Royal Flying Corps Hospital at Hampstead lie a number of these brave fellows in various stages of trouble, and Surgeon Graeme Anderson, R.N., who is looking after their welfare, is anxious to procure an Aeolian Vocalion cabinet gramophone to help relieve the monotony of the patient patients' lives during their temporary inaction. The cost of the instrument is about £50, and herein lies the chance of some generous benefactor to fill this very desirable want or head a subscription list for the purpose of presenting one of these cabinets to the hospital. "FLIGHT" will gladly receive any contributions to this end, and acknowledge them in these columns. They should be addressed to The Editor and R.F.C.H. Fund.

THE Editor of "FLIGHT" opens the fund with 105 shillings. Who will be the first to increase the amount by further shilling subscriptions?

So many pilots have lately been "losing their way" so frequently over Swiss territory as to make it very embarrassing for this neutral little republic. Therefore, according to a statement in the German press, the Swiss General Staff has notified all the belligerent military authorities that signal rockets are now sent up whenever a belligerent airman by mistake invades Swiss territory. Airmen thus warned are supposed to "turn back" without unnecessary delay.

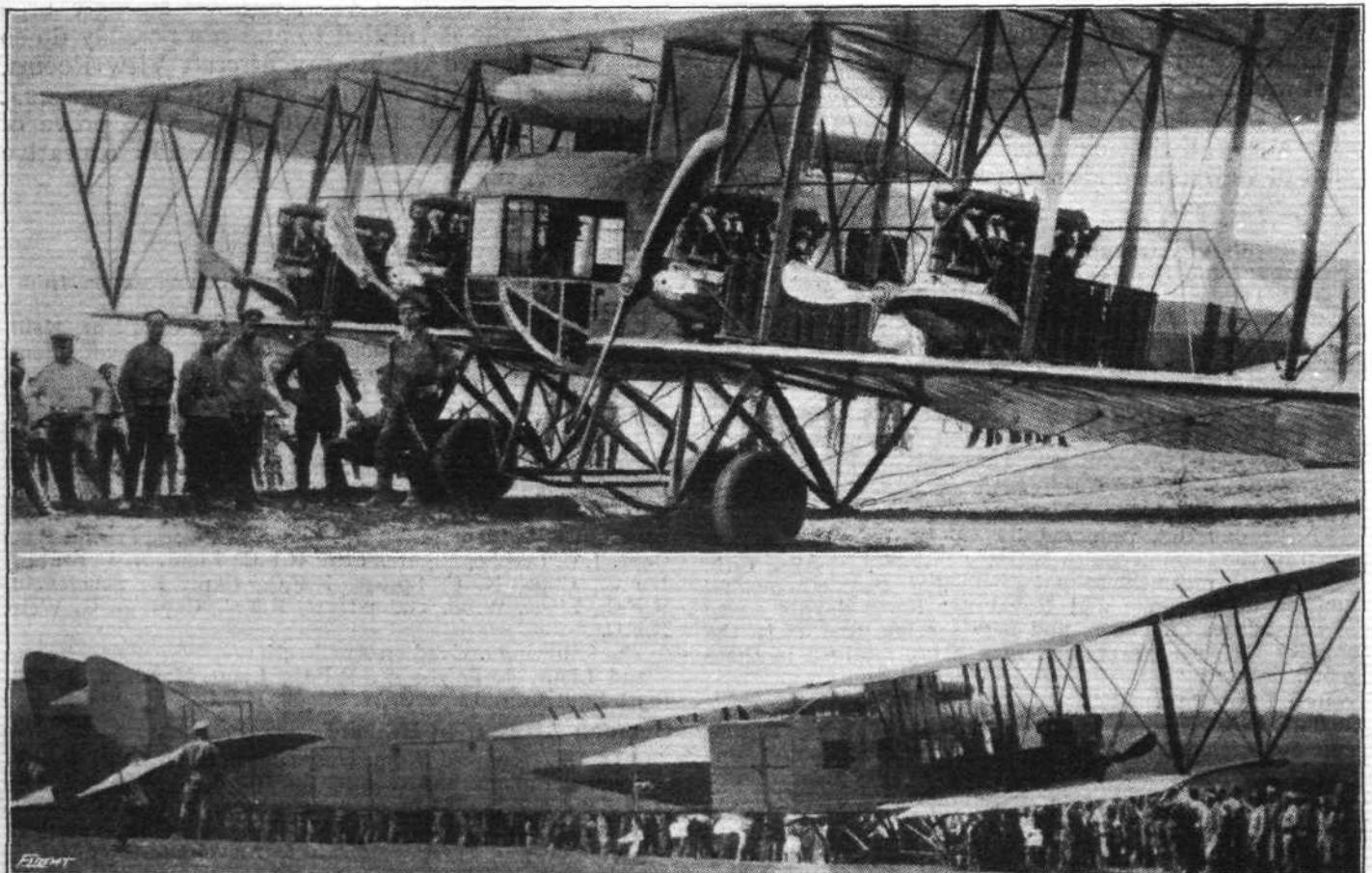
So Sawatis Tawanladah, the "chief" of the famous Iroquois Indians of Canada and of five other North American tribes, has passed away to his happy hunting grounds. Last January, it will be remembered, in this column we mentioned this Indian chief and the fact of his joining up with the R.F.C. in this country. Now it is announced that Lieut. John Randolph Stacey—which was Sawatis Tawanladah's name in the British army—was killed in a flying accident at Hounslow last Monday. And so passes away another of the

ancient links of the past, through the medium of the most modern science of the age.

By the offer of the Eastman Kodak Co. of Rochester, N.Y., to provide without charge temporary accommodation for an army school of aerial photography, where a thousand men can be trained every month, a great step forward has been made in helping our American Allies to efficiency. Incidentally such generous behaviour should carry its own reward when normal times return. Mr. Baker, the U.S. Secretary for War, has accepted the offer, and it is hoped that 4,000 to 5,000 men will be trained before August, when the work will be transferred to a permanent school.

WHAT aircraft has compelled in the movements of troops preparatory to any great offensive is brought into prominence in an article from the front by the special correspondent of the *Times*, on Tuesday last. Speaking of the extraordinary precautions necessitated by the untiring work of the Allies' aircraft, it has, the correspondent points out, become definitely known from staff orders captured that the great number of the divisions which the enemy were able to throw into their offensive, had to be transferred from other parts of the front and rear to the scene of operations by night. On arriving at each successive stage of their march the different regiments were ordered to appoint police patrols, whose duty was to guard in every way against detection by aircraft, to *camouflage* all vehicles and prevent any formation of groups of men in the streets or roads during the day. With the same object, a medical inspection was carried out company by company by the regimental surgeon, instead of all the sick of the regiment going to his quarters. No units were allowed to move by day. No bivouac fires were allowed, and all lights had to be carefully concealed. Any transgression, on which airmen were to report, was to be severely punished.

A DEFINITE statement in Parliament from the Postmaster-General last week that it is not proposed to establish an experimental postal aerial service in this country at present, as



Two views of a four-engined Sikorsky biplane.—From "Flugsport."





A battle-plane at eventide on the British Western Front in France.

*British Official.*

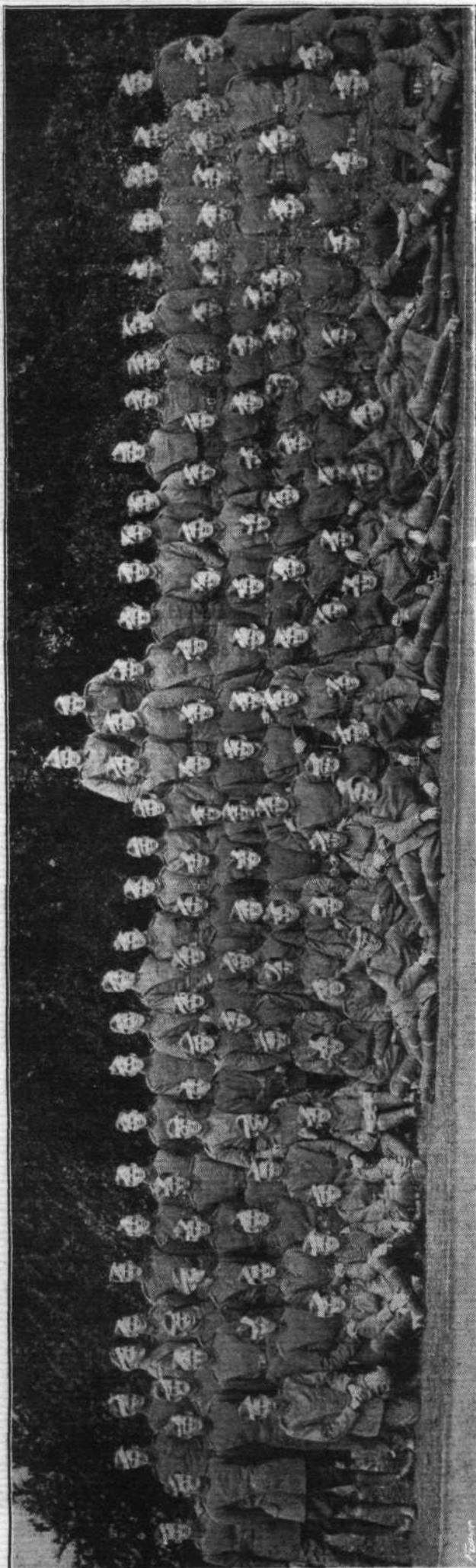
the whole resources of the aeroplane industry are required for military purposes, disposes of this question for the moment, although it carries with it the inference of activity when more normal times prevail. Fortunately the possibilities of aerial

post are not being altogether neglected in other directions, action in this respect being primarily brought about by the war conditions prevailing, as the great interruption of the mail traffic between Norway and the British Isles has become



*British Official.*

A famous R.A.F. Squadron on the British Western Front in France during the present German offensive. At least three enemy machines have been brought down by every pilot and observer in the above group.



A group of Flying Corps cadets, composed of both British and Boers, who have been recruited in South Africa.

so pronounced, that a move to remedy the position *via* the air is now taking definite shape. Summarised by the *Christiania correspondent of the Times*, the latest developments embrace a scheme for an air mail service, backed by a large company, which includes many of the most prominent men in various fields of Norwegian industrial activity. The company the writer states, is the Norwegian Air Route Company, which is now being formed in Norway. Its share capital is already more than £150,000, and it is increasing every week. Its subscription list was to be issued on April 8th, in £55 shares. It has met with unqualified support on the part of the entire Norwegian press. It will be remembered that just before war broke out, Capt. Tryggve Gran, of the British Army, made the first air trip across the North Sea, covering the distance between Aberdeen and Stavanger in about 5 hours. He is now on leave in Norway, where he has been welcomed by his countrymen. The aim of the Air Route Company is to open as soon as possible a regular mail traffic by air between Aberdeen and Stavanger, with the necessary arrangements for continuation from there—from Stavanger *via* Christianssand to Christiania; from Stavanger to Copenhagen, also *via* Christianssand; and north from Stavanger to Bergen and North Norway. It is estimated that the passage of the North Sea could be made in about 4½ hours, and that, as a general rule, the air mail would leave Aberdeen in the morning and would reach both Christiania and Copenhagen in the afternoon. In this connection I may mention that in May a regular air route will be opened between the Skaw and Copenhagen.

I need hardly insist that such an air route, even if it were only practicable twice a week, would be a very great improvement as compared with the conditions now obtaining. Norwegian experts appear to have no doubt about its possibility. But the promoters of the Air Route Company and all interested in the scheme realise that sympathy and practical support from Great Britain are essential for success. Accordingly, Capt. Gyth Dehli, Director of the seaplane works of the Royal Norwegian Navy and technical expert to the Air Route Company, is already in Great Britain, negotiating with the British authorities for a satisfactory solution of the problems involved.

L. F. D. writes, *apropos* the "What is it?" badge recently published in "FLIGHT":—"I have been able to ascertain from a reliable source that the German silver badge mentioned in *Airisms* of your issue of March 28th is a decoration for flight 25 times over the enemy lines or country."

A PILOT's "life of luxury" out yonder may fit in with the conceptions of some who have seen and have in mind only the silver lining of the rest period of our Air Force at the Front, but by way of the other side of the picture the following extract from the letter of one of our fighting boys, who has been strafing in the British right wing, hardly fits into the frame of drawing-room pleasures suggested as the normal conditions of R.F.C. pilots when on active service. The pilot's letter runs as follows:—

"It seems years since I had a good sleep, and I can't remember when I washed last. My memory of the last few days is a nightmare vision of always flying and shooting and bombing German infantry and transport; changing machine-gun drums; continuous flying; then back to a strange aerodrome, with a machine riddled with bullets from the ground. Everywhere mechanics are working like demons, refilling the tanks, and fitting more bombs and ammunition. Then off I fly again, only a few hundred feet up, miles behind the Hun lines, looking for his transport and troops.

"I am writing at 6.30 a.m. We were to leave the ground at dawn, but a drifting mist has stopped that, and we are waiting for it to clear. This is the first spare few minutes I have had for several days. Up before dawn, and never to bed before midnight.

"The work is dangerous—not because of the German machines, but because we fly so low that the ground machine guns get a perfect target. I caught about 3,000 infantry yesterday, packed in fours along a road, emptied all my ammunition into them, and left them streaming across the fields, minus ominous black heaps. My engine was shot through, but just brought me home."

◆ ◆ ◆ ◆

#### The King at an Air Station.

It was announced in the *Court Circular* of April 11th that the King and Queen visited an Air Station on the morning of that day, and were received on arrival by Brigadier-General H. D. Briggs and Captain the Prince Albert, R.A.F. On the conclusion of the inspection Their Majesties left by special train for Windsor, reaching the Castle shortly after 6 o'clock.



# INTERNATIONAL AIRCRAFT STANDARDS.

(Continued from page 399.)

## 4P4—Specification for Plain, Ball, and Castle Hexagon Nuts for Aircraft.

TABLE 1.—DIMENSIONS AND TOLERANCES FOR PLAIN NUTS.

A. Bolt size. in.	B, width across flats. in.	N. Thickness. in.	A. Bolt size. mm.	B, width across flats. mm.	N. Thickness. mm.
0.112	0.250	0.094	2.85	6.35	2.38
0.138	0.313	0.109	3.51	7.94	2.78
0.164	0.375	0.125	4.17	9.53	3.18
0.190	0.375	0.141	4.83	9.53	3.57
0.216	0.438	0.156	5.49	11.11	3.97
0.250	0.438	0.188	6.35	11.11	4.76
0.313	0.500	0.234	7.94	12.70	5.95
0.375	0.563	0.281	9.53	14.29	7.14
0.438	0.688	0.328	11.11	17.46	8.33
0.500	0.750	0.375	12.70	19.05	9.53
0.563	0.875	0.422	14.29	22.23	10.72
0.625	0.938	0.469	15.88	23.81	11.91
0.688	1.000	0.516	17.46	25.40	13.10
0.750	1.063	0.563	19.05	26.99	14.29
0.875	1.250	0.656	22.23	31.75	16.67
1.000	1.438	0.750	25.40	36.51	19.05

TABLE 2.—DIMENSIONS AND TOLERANCES FOR BALL NUTS.

Ball hexagon.				Ball castle			
A. Bolt size. in.	B, width across flats. in.	N. in.	R. in.	B. in.	N'. in.	S. in.	O. in.
0.164-32	0.375	0.172	0.375	0.375	0.250	0.078	0.078
0.190-32	0.375	0.172	0.375	0.375	0.250	0.078	0.078
0.216-32	0.438	0.172	0.375	0.438	0.266	0.078	0.094
0.250-28	0.438	0.203	0.375	0.438	0.297	0.078	0.094
0.313-24	0.500	0.250	0.375	0.500	0.344	0.078	0.094
0.375-24	0.563	0.313	0.500	0.563	0.438	0.125	0.125
0.438-20	0.688	0.359	0.500	0.688	0.484	0.125	0.125
0.500-20	0.750	0.375	0.500	0.750	0.563	0.125	0.188
mm.				mm.			
4.17-32	9.53	4.37	9.53	9.53	6.35	1.98	1.98
4.83-32	9.53	4.37	9.53	9.53	6.35	1.98	1.98
5.49-32	11.11	4.37	9.53	11.11	6.75	1.98	2.38
6.35-28	11.11	5.16	9.53	11.11	7.54	1.98	2.38
7.94-24	12.70	6.35	9.53	12.70	8.73	1.98	2.38
9.53-24	14.29	7.94	12.70	14.29	11.11	3.18	3.18
11.11-20	17.46	9.13	12.70	17.46	12.30	3.18	3.18
12.70-20	19.05	9.53	12.70	19.05	3.18	3.18	4.76

TABLE 3.—DIMENSIONS AND TOLERANCES FOR CASTLE HEXAGON NUTS.

A. Bolt size. in.	B, width across flats. in.	N. in.	S. in.	O. in.	M. in.	L. in.	R. in.
0.164-32	0.375	0.234	0.078	0.078	0.156	0.016	0.094
0.190-32	0.375	0.250	0.078	0.078	0.172	0.116	0.094
0.216-32	0.438	0.266	0.078	0.094	0.172	0.031	0.094
0.250-28	0.438	0.281	0.078	0.094	0.188	0.031	0.094
0.313-24	0.500	0.328	0.078	0.094	0.234	0.031	0.094
0.375-24	0.563	0.406	0.125	0.125	0.281	0.031	0.094
0.438-20	0.688	0.453	0.125	0.125	0.328	0.047	0.125
0.500-20	0.750	0.563	0.125	0.188	0.375	0.047	0.125
mm.				mm.			
4.17-32	9.53	5.95	1.98	1.98	3.97	0.40	2.38
4.83-32	9.53	6.35	1.98	1.98	4.37	0.40	2.38
5.49-32	11.11	6.75	1.98	2.38	4.76	0.80	2.38
6.35-28	11.11	7.14	1.98	2.38	5.16	0.80	2.38
7.94-24	12.70	8.33	1.98	2.38	5.95	0.80	2.38
9.53-24	14.29	10.32	3.18	3.18	7.14	0.80	2.38
11.11-20	17.46	11.50	3.18	3.18	8.33	1.19	3.18
12.70-20	19.05	14.29	3.18	4.76	9.53	1.19	3.18

NOTE.—Chamfer to be omitted on sizes smaller than 0.250 in. diameter.

GENERAL.—1. The general specifications, 1G1, shall form according to their applicability, a part of these specifications.

USE.—2. These nuts are to be used on bolts (I.A.S.B. specification 4P3).

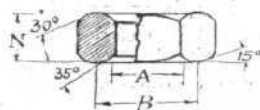


Fig. 1.

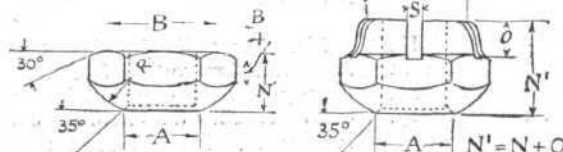


Fig. 2.

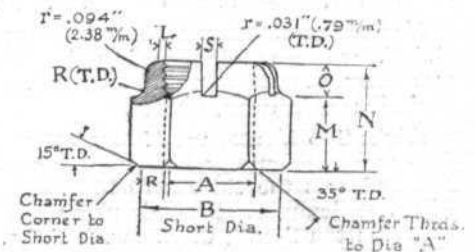


Fig. 3.

MATERIAL.—3. The nuts shall be machined from cold-rolled or drawn steel, I.A.S.B. specification 3S20.

MANUFACTURE.—4. The nuts shall be cyanide hardened. The nuts shall be copper-plated in a cyanide bath and then nickel-plated; the coating shall not exceed 0.001 in. (0.0254 mm.).

WORKMANSHIP AND FINISH.—5. The inside face shall be flat and free from burrs.

PHYSICAL PROPERTIES AND TESTS.—6. Nuts shall withstand having the inside diameter increased 25 per cent. by drifting without cracking. One per cent. of each size of all nuts shall be subjected to the drift test.

DIMENSIONS AND TOLERANCES.—7. The nuts shall be of the form shown in figures 1, 2, and 3, and shall conform to the dimensions within the tolerances given in Tables 1, 2, and 3. The values represent the finished dimensions after copper and nickel plating.

DELIVERY, PACKING, AND SHIPPING.—8. The nuts shall be delivered in boxes of gross weight not exceeding 50 lb. (22.7 kg.). The lots of individual sizes shall be packed in strong manila envelopes or cartons.

## 4P5—Specifications for Square and Round Bevel Washers.

GENERAL.—1. The general specifications, 1G1, shall form, according to their applicability, a part of these specifications.

USE.—2. These washers are to be used on bolts (I.A.S.B. specification 4P3).

MATERIAL.—3. The washers shall be machined from cold-rolled or drawn steel (I.A.S.B. specification 3S20).

MANUFACTURE.—4. The washers may be cut by shearing if this can be done without distorting the surface. They shall be cyanide hardened. The washers shall be copper-plated in a cyanide bath and then nickel-plated; the coating shall not exceed 0.001 in. (0.0254 mm.) in thickness.

WORKMANSHIP AND FINISH.—5. Both sides must be flat and free from burrs.

PHYSICAL PROPERTIES AND TESTS.—6. Washers selected for the bend test shall be firmly clamped in a square nose vice and bent through an angle of 30 degrees. They shall withstand this bending without cracking. One of every 250 washers shall be subjected to the bend test.

DIMENSIONS AND TOLERANCES.—7. The washers shall be of the form shown in figures 1 and 2 and shall conform to the

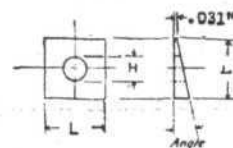


FIG. 1. SQUARE WASHER

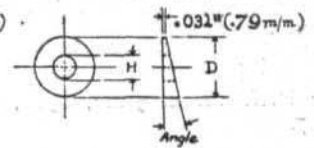


FIG. 2. ROUND WASHER

dimensions within the tolerances given in following table. The values represent the finished dimensions after copper and nickel plating.

## DIMENSIONS AND TOLERANCES FOR BEVEL WASHERS.

(Values of angles are 6, 12, 24 or 36 degrees for all sizes.)

Bolt size		H.		D.		L.		Bolt size		H.		D.		L.	
No.	inch	No.	inch	inch	inch	Milli-metres	Milli-metres	No.	inch	No.	inch	inch	inch	Milli-metres	Milli-metres
4	0.112	31	0.120	0.375	0.375	2.85	3.05	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53
6	0.138	26	0.147	0.438	0.375	3.51	3.73	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11
8	0.164	17	0.173	0.469	0.469	4.17	4.39	11.91	11.91	11.91	11.91	11.91	11.91	11.91	11.91
10	0.190	8	0.199	0.500	0.469	4.83	5.05	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
12	0.216	1	0.228	0.563	0.531	5.49	6.09	14.29	14.29	14.29	14.29	14.29	14.29	14.29	14.29
..	0.250	..	0.266	0.625	0.531	6.35	6.75	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88
..	0.312	..	0.328	0.688	0.566	7.93	8.33	17.46	17.46	17.46	17.46	17.46	17.46	17.46	17.46
..	0.375	..	0.391	0.750	0.656	9.52	9.92	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05
..	0.437	..	0.453	0.875	0.875	11.11	11.50	23.81	23.81	23.81	23.81	23.81	23.81	23.81	23.81
..	0.500	..	0.516	1.000	0.875	12.70	13.10	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40

DELIVERY, PACKING, AND SHIPPING.—8. The washers

shall be delivered in boxes of gross weight not exceeding 50 lb. (22.7 kg.). The lots of individual sizes shall be packed in strong manila envelopes or cartons.

(To be continued.)

## The Future of Aerial Transport.

THERE should be a good audience in the Lecture Theatre of the Literary and Philosophical Society, Newcastle-on-Tyne, on Tuesday, 23rd inst., at 6 p.m., when Mr. G. Holt Thomas will lecture under the auspices of the N.E. Coast Institution of Engineers and Shipbuilders on "The Future of Aerial Transport." The lecture will be illustrated by cinematograph films.

# Personals

## Casualties.

Second Lieutenant JAMES GRAHAM GLENDINNING, Monmouthshire Regiment, attached R.F.C., who was killed in action on December 2nd, 1917, aged 20, was the only son of Dr. and Mrs. Glendinning, Hillcrest, Abergavenny.

Captain JACK ECKERSLEY GREENALL, Yeomanry, attached R.F.C., who was killed in action on March 31st, aged 28, was the eldest surviving son of Mr. and Mrs. Henry Greenall, The Elms, Moore, Warrington.

Second Lieutenant MAX SEAHOLME, R.F.C., who met his death in France, on Good Friday, while on active service, was the only child of Mr. and Mrs. Sjöholm, of "Sunhill," Woodlands Crescent, Muswell Hill Road. Lieutenant Seaholme (he adopted the English style of his parents' surname) was of Danish nationality, but had resided in Muswell Hill since childhood, and was educated at Highgate School. At the outbreak of war he was only 15 years of age, but at the earliest moment entered the R.F.C. and completed his training as a pilot. Early in Easter week he went to France but was only four days on active service when his parents received the sad news of his death.

Second Lieutenant HENRY ARTHUR SOMERVILLE, M.C., R.A.F., has been killed in action. With his pilot he brought down Max Müller, the crack German airman, on January 9th.

Flight Sub-Lieutenant T. R. SWINBURNE, R.N., who has been missing since June 8th, and is now presumed by the Admiralty to have been killed on that date, was the only son of Major and Mrs. T. B. Swinburne, of "Holmwood," Beechwood Avenue, Finchley, and formerly of Glassensikes, Dartington. Born in February 1898, he was educated at Westminster School, and King's College, London. He joined the R.N.A.S. in June, 1916, and went to France in May, 1917.

Second Lieutenant F. J. (FRANK) CUNNINGHAM, R.F.C., and 1st Canadian Contingent, has died, on April 6th, at Westdene, Earley, Reading, the home of his parents, from illness contracted on active service, aged 29 years.

Lieutenant EDWARD JOSEPH DILLON, M.M., R.A.F., who was killed in an aeroplane accident on April 12th, aged 23, was the eldest son of Mr. and Mrs. J. T. Dillon, 149, Walm Lane, Cricklewood, N.W. He was educated at St. Edmund's College, Old Hall. He joined the R.A.M.C. in August, 1914, gained the Military Medal in France in 1915, and obtained his commission in the R.F.C. in August, 1917.

Lieutenant NORMAN HERBERT ENGLAND, R.A.F., who was killed on April 7th, in a flying accident, aged 31, was the son of Major F. H. England, late Royal Welch Fusiliers, and Mrs. England, 29, Campden House Road, Kensington.

Flight Sub-Lieutenant HOWARD RAYMOND GILLET, R.N.A.S., who was killed on March 6th whilst flying in Kent, at the age of 18, was the only child of Mr. and Mrs. Raymond Gillett, 101, Broadhurst Gardens, N.W.6.

Lieutenant BENEDICT HENRY MELVILL JONES ("TOPS"), R.A.F., who was killed while flying in April 14th, aged 20, was the youngest son of Mr. and Mrs. Benedict Jones, of the Red House, Ashted, Surrey.

Flight Sub-Lieutenant HAROLD CALDECOTT LAKE, R.A.F., who was accidentally killed on April 5th whilst flying in England, was the elder son of Mr. and Mrs. James C. Lake, of 84, Rodenhurst Road, Clapham Park, S.W.4, and 13-15, Little Sutton Street, Clerkenwell, E.C.1. His age was 21.

Second Lieutenant GEORGE B. JOHNSTONE STODDART, R.A.F., who was accidentally killed while flying abroad on April 10th, aged 18, was the son of Mrs. Stoddart, and stepson of Dr. W. H. B. Stoddart, of Harcourt House, Cavendish Square, W.

## Married.

The *Aerial Age* reports that Captain E. C. BASS, who has been engaged for the last two years in experimental work in the States, has married Miss XENIA GREVILLE MOORE, daughter of the Baroness de Montanu.

Mr. ROBERT LAMBERT DUNVILLE, Grenadier Guards, eldest son of Lieut.-Col. John Dunville, R.A.F., and Mrs. Dunville, of 46, Portland Place, W., was married to Miss WINIFRED PHYLLIS COMBE, elder daughter of Capt. Christian

and Lady Jane Combe, of 45, Belgrave Square, S.W., and Strathconan, Muir of Ord, at the Guards Chapel, Wellington Barracks, on April 9th. A guard of honour was furnished by a detachment of the Grenadier Guards, who formed an archway with Lewis guns as the bride and bridegroom left the chapel.

Lieutenant THOMAS GEORGE GREENWELL, R.A.F., only son of Mr. and Mrs. T. W. Greenwell, "Northwood," Sunderland, was married on April 9th at All Saints' Church, Gosforth, Northumberland, to MABEL WINIFRED, elder daughter of Mrs. T. H. CATCHESIDE, and the late Mr. T. H. Catcheside, J.P., Inglewood, Gosforth, Northumberland.

Major H. J. F. HUNTER, M.C., Rifle Brigade and R.A.F., and the Hon. Mrs. PEARSON, widow of the Hon. Geoffrey Pearson, who was killed in September, 1914, were married on April 11th.

Captain HERBERT E. STEINBERG, R.A.F., son of the late Geo. H. Steinberg and Mrs. Steinberg, of Hampstead, was married on April 10th, at Brompton Parish Church, to EDITH MAYNE, only daughter of R. E. GOING, Esq., and Mrs. GOING, of 51, Kensington Hall Gardens, and grand-daughter of the late John Going, of Cragg, Tipperary.

Lieutenant AUBREY WILLIAM THOMPSON, R.A.F., youngest son of H. C. Thompson, of Buenos Ayres, was married on April 9th at St. Mary Abbot's, Kensington, to MARY ELLEN ABBOTT, younger daughter of the late Mrs. John Venables Abbott.

## To be Married.

The engagement is announced of Flight Commander OLIVER COLIN LE BOUTILLIER, son of Mr. and Mrs. Oliver le Boutillier, of Glenwood Avenue, East Orange, N.J., and Miss JEAN LINDSAY WITHROW, daughter of Mr. and Mrs. John G. Withrow, of Park Avenue, East Orange, N.J.

An engagement is announced between Captain CHARLES COOK, R.A.F., and Miss DISNEY only daughter of Norton Disney, of The Hyde, Essex.

The engagement is announced between Surgeon ALEC GEORGE HOLMAN, R.N. (attached R.A.F.), second son of the late Frank Holman, and Mrs. Holman, of Westbury-on-Trym, Bristol, and GRACE KATHLEEN, fifth and youngest daughter of the late CHARLES N. BROWN, and Mrs. BROWN, of The Elms, Southtown, Great Yarmouth.

The marriage arranged between Lieutenant HARRY KENT, King's Liverpool Regiment and R.F.C., and Miss DEUCHAR will take place at St. Mark's, North Audley Street, on April 30th, at 12.30.

The engagement is announced of Mr. N. L. MOON, Hussars, attached R.A.F., second son of Mr. and Mrs. James Moon, Campden Hill Court, Kensington, and MARY FLORENCE, second daughter of Sir HENRY and Lady ROBERTSON, Palé, Corwen, N. Wales.

An engagement is announced between Captain S. G. C. TAYLOR, R.F.C., only son of Mr. and Mrs. Sinclair Taylor, of Bettws, Wales, and KATHLEEN (KAY), only daughter of Mr. and Mrs. T. LUMSDEN, of Dartmouth Lodge, Low Fell, Durham.

## Items.

Mr. ALAN E. L. CHORLTON, who has been appointed Assistant Controller of Aircraft Production to deal with the supply of aero engines, is a member of the Institutions of Civil Engineers, Mechanical Engineers, and Electrical Engineers. He is also a member of the American Society of Mechanical Engineers and a member of the Board of Invention and Research.

LIEUT. the Hon. VERE SIDNEY TUDOR HARMSWORTH, R.N.V.R., second son of Lord Rothermere, and nephew of Lord Northcliffe, of Hemsted, Cranbrook, Kent., who was killed in action on November 13th, 1916, aged 21 years, intestate, has left £32,435, of which £20,219 is net personalty.

Captain MCCUDDEN, V.C., the airman, is to be presented with a testimonial by the Borough of Chatham, of which town he is a native.

It was announced in the *Court Circular* of April 13th that the LORD ROTHERMERE (President of the Air Council) had an audience of His Majesty the King at Buckingham Palace.



MAJOR-GENERAL SYKES, the new Chief of the Air Staff, qualified as a pilot (No. 95) on June 20th, 1911, being among the first officers to do so. In November, 1911, he was one of the two members of the Flying Corps Committee which, under the chairmanship of the Secretary of State for War (then Col. J. E. B. Seely), drew up the original scheme for the organisation of the R.F.C. This was approved by the Committee of Imperial Defence, and in 1912 the Air Force was constituted as a Naval Wing, a Military Wing, and a Central Flying School for Pilots. Lieut.-Col. Sykes, as he then was, became Officer Commanding the Military Wing, R.F.C. He founded the flying centres of Montrose and Netheravon, established and commanded the Concentration Camp, R.F.C., on Salisbury Plain, in the summer of 1914, and when on the outbreak of war Lieut.-General Sir David Henderson took the Flying Force to France, Colonel Sykes served as chief officer to the force. The pilots flew to Amiens and proceeded to Maubeuge, and the force accompanied the Army during the retreat to the Marne and the advance to the Aisne. In May, 1915, Col. Sykes was sent by Lord Kitchener to report on the position in the Dardanelles from the air point of view. His report was approved, and, with the rank of Colonel Commandant of Marines and Wing Captain, R.N.A.S., he took charge of the Flying Force at the Dardanelles and commanded it there until the evacuation of the peninsula in 1916. After a period of duty as Deputy-Director of Organisation at the War Office, he was appointed a member of the Supreme War Council at Versailles, a post he held until his present appointment.

MAJOR-GENERAL SIR HUGH MONTAGUE TRENCHARD, K.C.B., D.S.O., who has just retired from his position as Chief of the Air Staff, was born on February 3rd, 1873. He entered the Royal Scots Fusiliers through the Militia in

1893, and became captain early in 1900. He had meantime seen service in South Africa with the Imperial Yeomanry, Bushmen Corps, and afterwards with the Canadian Scouts. While serving with the latter, he was dangerously wounded, and was awarded the Queen's medal with three clasps, and the King's medal with two clasps. He became brevet major in 1902, and served with the West African Frontier Force between 1903 and 1910. Here he rose to be commandant of the North Nigerian Regiment, in 1908, having previously been mentioned in despatches and having gained the D.S.O. in 1906; with the West African Frontier Force he won a medal and three clasps.

Towards the end of 1912 he became instructor, with the grade of squadron commander at the Central Flying School, being promoted a year later to assistant commandant. At the outbreak of war in 1914 he became commandant of the Military Wing of the R.F.C. In 1915 he was promoted, first, Lieutenant-Colonel (January 18th), then Colonel (June 3rd), with, later, the temporary rank of brigadier-general. He held this rank from August 25th, 1915, to March 23rd, 1916, when he became Major-General (temp.). In June, 1915, he became A.D.C. (extra) to the King and brigade commander a month later. After a long period of distinguished service in France he became a member of the Air Council as Chief of the Air Staff when the Council was constituted last January, and has thus been intimately associated with the task, now complete, of amalgamating the two Flying Services in the Royal Air Force.

During the visit of the King and Queen to Lincoln on April 9th, Sir HENRY FOWLER (Assistant Director of Aircraft Production) was in attendance, representing the Ministry of Munitions.

## CONSTRUCTION OF "PLANES" WITH PRESENT ORGANISATION, AND PLANT NOW IN BEING.\*

By E. H. HUMPHRIES.

I HAVE had great interest in the subject of aviation since its inception, and belong to one of the oldest associations in connection with flying as a practical art, and after studying the question of aircraft production as applied to the present stress of war, several questions arose in my mind as to whether the best means were being adopted to quick, reliable production of what has proven to be one of the big factors in the great fight. Briefly, I have found that a number of aeroplanes were being produced at certain centres, and that component parts were being made hundreds of miles from their base; not only that, they were made in one place, examined in another, assembled in yet another, with all the consequential delays. Still looking deeper, I find that my own town of Birmingham was producing practically all the parts required for an aeroplane, from the smallest pressing to the twelve-cylinder aero engine.

The last remark brings me to the heart of my subject—we are all agreed, I think, that Birmingham possesses all the equipment, most of the material is manufactured there, the labour is skilful, and adapted to found a huge industry in this district if only we can get the Government to think large enough. Efficiency of construction should be our watchword rather than consideration should be shown to a superlative finish.

To bring this scheme into being would simply mean the calling together of all employers interested, in the various districts, told plainly what was expected of them, and have drawings—and where possible, samples of all the parts disassembled—in rooms for reference.

The Area Superintending Engineer would then visit each works if needs be, to see that no firm take on more work than they can conveniently do in a given time, and further, subcontracting should be rigorously cut out. A manufacturer should know that by application to his Area Superintending Engineer's office, he can immediately get all and every information he requires. Nothing here offered by me is actually new. I do not claim originality, co-operation is as old as history itself; it is just the peculiar view point that is required, together with a conception of the military requirements, large enough to bring about an organisation which undoubtedly will go a long way to shorten this war.

### Suggested Scheme for the Production of Aircraft in Quantities.

Up to the moment the great difficulty in connection with aircraft production in quantities has been that no set model

was available to produce in such huge quantities that co-operation could be enrolled.

At present it is believed that we have a machine which will be wanted in thousands which may safely be produced without the fear of the last thousand produced being obsolete. Therefore, it becomes necessary to bring a co-operative scheme into being if the aircraft is to be produced quickly. Drawings and plans of this particular machine are to be seen in London, and supposing a complete set of these are obtained, the work of allocation could be carried out as follows: by (a) engineers; (b) woodworkers. Tubular construction is more and more finding its own in the realm of aeroplane practice; the whole of the landing gear and undercarriage of this plane is of weldless steel tube, meaning that the bicycle makers of the Midlands would be particularly applicable for the manufacture of this component.

ENGINES.—These being manufactured by highly specialised plant should be left in the hands of those houses who have already proven that they can produce a good class aircraft engine, while the whole energies of such houses should be conserved on engines and not be diverted to thoughts of wing, fuselage and tail construction. Supposing under the care of the Superintending Engineer, working in conjunction with the Management Committees of the various Munition Committees, if it could be arranged that one huge shop was erected (either of wood or plastic), it would be quite efficient for the reception of the whole of these parts, where they would be passed through Government Bond, inspected, and passed out at the other end for the complete assembly of aircraft. This would mean that at most twelve weeks after the various manufacturers had received their orders for component parts, assembly of the complete aeroplane could be undertaken. This shop would be built somewhere adjacent to open space where flying is permissible, that experiments may be carried out by any of the "co-opped" manufacturers, with a tendency to improve. Marvellous steps have been made in the advancement of aircraft construction, considering the few brains that have devoted themselves to its perfection.

On the other hand, if some hundreds of manufacturers are devoting their energies to aircraft advancement, improvements become the more rapid, since you have the use of so many brains, and what is more to the point, the application on inventiveness can be given a practical test against the manufacturers' own works. At the present time an idea, however good, has to stand the racket and criticism of an engineer in one or other of the aircraft works near Hendon, who probably has been striving for months to attain the same object. As an instance, a machine was consistently turned

\* A paper read before the Midlands Munitions Committee, Nottingham.

down by the engineers in charge in London for eighteen months, whereas now it has been found necessary to call a conference of manufacturers as late as a fortnight since, at the Air Board Offices in London, to urge that they should go back and work night and day, irregardless of cost.

As an illustration of what is meant by co-operation, the Air Board have now entrusted the component parts of this machine to about seventy firms, not counting the engine makers, who will in various parts of the country manufacture component parts for its complete assembly miles away. This I respectfully submit is financially an unsound proposition. We ourselves are engaged upon tubular construction work for this machine, upon which, should anything be found wrong, it has to come all the way back to Birmingham, with the consequential rail and transportation delays.

Another case I can cite is pressings for engine tappets were ordered in Birmingham by a Coventry house, despatched to Coventry, where they had simply to be polished and gauged. From there they were re-despatched to the engine makers in another town, while the steel itself came from Sheffield. Had it been arranged for Birmingham manufacturers to make the whole complete component parts only, and they were assembled in some shops as laid out in the first portion of this paper, the delay would be one of hours only.

I may say that this scheme has been laid before the Air Board, who think it good in every particular.

My own idea is that the military necessity is such that 25,000 aeroplanes should be commenced upon at once. I suggest it would be far better to spend an extra million sterling on aircraft, even though it is all wasted ultimately, than to be behind with our military strategy. No one house or factory in this country is capable of tackling one-half of 25,000 machines; it therefore becomes increasingly necessary for a co-operative scheme of some description to be brought into being, and at once. We have in the Midlands every facility for the production of aircraft in enormous quantities.

As a further example of what can be done by co-operation, I would cite the cycle trade, which has built one of the finest

engineering feats the world has ever known, in the ordinary pedal cycle. Hardly any one house to-day builds a complete bicycle themselves throughout. Brakes are specialised in; lugs and fittings are specialised in; tube drawing is specialised in; tube bending and manipulation is specialised in; axles cups, bearings, etc., are specialised in; rims are specialised in; tyres are specialised in; the whole are brought into the assembling shop, where they are made into a homogeneous bicycle, and taking the basis cost of a pedal cycle at £5, by the above method pounds each are saved on production. Such a degree of perfection had it reached prior to the war, that a complete bicycle, minus tyres, guaranteed for ever, could be purchased at 52s. 6d. under this system.

To carry the matter further, I would cite as an instance the Ford motor car, which in its early days was simply assembled at the Ford shops, of parts obtained from various manufacturers in the U.S.A. It was just an assembled job of parts made in various factories, which first gave the Ford the low price which enabled him to place an article on the market £100 lower than his nearest competitor. The same truth will come to light in aeroplane assembly. In that business they did not call the scheme "co-operative" but "specialisation," and I submit that if the one term is unpalatable, the other should be used.

The following rough list of producers of component parts are what are required, and I submit that the machinery for the whole of this can be found in Birmingham already installed, with a management active enough and in being to turn out the parts at a few weeks' notice, without unduly interfering with the ordinary output of munitions in general:—Aluminium castings, aircraft fittings, lugs, weldless tubes, nuts and bolts, wood workers, press workers, brassfounders, wire manufacturers, tinsmiths, sheet metal workers, wheel builders, assemblers.

And in this last particular I would mention that the cycle, motor-cycle and car fitters of Coventry have been found to turn out admirably in the swift assembly of aeroplanes, readily tumbling into the work. America already has the above scheme in being; we must move quickly if a fine industry is to be founded in its entirety for the Midlands.



## The R.F.C. in Italy.

IN his despatch dated March 9th on the operations of the forces under his command in Italy, General Sir Herbert Plumer, G.C.B., G.C.M.G., G.C.V.O., says:—

"Since the beginning of February the weather has become bad, a considerable amount of snow has fallen, and visibility has been poor, which has interfered considerably with air and artillery work.

"The work of the R.F.C. under Brig.-General Webb-Bowen during the period under review has been quite brilliant. From the moment of arrival they made their presence felt,

and very soon overcame the difficulties of the mountains. They have taken part in all operations, and rendered much assistance to the Italians in the air. They have carried out a large number of successful raids on enemy aerodromes, railway junctions, &c., and have during the period destroyed sixty-four hostile machines, a large proportion of which were German, and nine balloons, our lossess to the enemy during the period being twelve machines and three balloons, a record which speaks for itself.

"The close co-operation between the Artillery, Intelligence, and R.F.C. under conditions strange to previous experience was entirely satisfactory."



A German Seaplane about to take the Water.—Note the peculiar strutting of the floats and the cowling of the vertical water-cooled engine.



# The British Air Services

"PER ARDUA AD ASTRA"

## The Royal Air Force.

*London Gazette Supplement, April 9th.*

The following appointments are made at the Air Ministry:—  
*S.O., 1st Class.*—Capt. (Temp. Maj.) A. B. Winch, and to be Temp. Lt.-Col. whilst so employed; April 3rd.

*S.O., 2nd Class.*—The rank of Capt. L. W. W. Lees is as now stated, and not as in the *Gazette* of April 2nd.

*S.O., 3rd Class.*—The initials of Capt. P. N. Logan are as now stated, and not as in the *Gazette* of April 2nd.

*S.O., 4th Class.*—The surname of 2nd Lieut. (Temp. Lieut.) G. F. Allison is as now stated, and not as in the *Gazette* of April 2nd.

*Memoranda.*—C. B. Heald (Temp. Maj., R.A.M.C.) is granted a temp. commission as Lieut.-Col.; April 1st.

Capt. F. G. Wilson to be Temp. Maj., without the pay and allowances of that rank, whilst specially employed; April 10th.

Temp. 2nd Lieut. (on prob.) R. Wilde to relinquish his commission on account of ill-health; April 10th.

*London Gazette Supplement, April 12th.*

The following appointments are made at the Air Ministry:—  
*S.O., 2nd Class.*—Capt. H. Foord, and to be Temp. Maj. while so employed; April 1st. Capt. (Temp. Maj.) W. J. C. Kennedy-Cockran-Patrick, D.S.O., M.C.; April 6th.

## Memoranda.

2nd Lieuts. are granted the rank of Temp. Capt. (ad.) while employed as Courts-Martial Officers:—G. Johnson, A. W. Rippon; April 1st.

Lieuts. to be Temp. Capt. without the pay and allowances of that rank, while specially employed:—V. J. Hammond, L. F. Jones, A. L. Harrow-Bunn, M.C., A. L. Wilson, R. M. Nicholls, F. Tymes, M.C., S. T. Fripp; April 1st.

2nd Lieut. (Hon. Lieut.) R. Cook to be Temp. Capt. without pay and allowances of that rank, while specially employed; April 1st.

## Royal Flying Corps (Military Wing).

*London Gazette Supplement, April 9th.*

The following appointments are made:—  
*Wing Commander.*—Maj. (Temp. Lieut.-Col.) J. A. Chamier, D.S.O., Punjab, Ind. Army, a Comdt. (graded as a Wing Comdr.), Arty. and Inf. Co-operation School, and to retain his temp. rank while so employed; March 1st, seniority from April 29th, 1917.

*Flight Commanders.*—From Flying Officers, and to be Temp. Capt. while so employed:—Temp. 2nd Lieut. D. M. McGoun, Gen. List; March 8th. Lieut. F. G. C. Weare, E. Kent R.; March 11th. Temp. 2nd Lieut. I. D. R. McDonald, Gen. List; March 15th. Lieut. W. L. Wells, Middx. R. (T.F.); March 19th. Capt. (Temp. Maj.) R. A. Archer, M.C., R.A., reverts from a Sqdn. Comdr., and relinquishes his temp. rank; March 16th, seniority from March 1st, 1916.

*Flying Officers.*—2nd Lieut. E. C. Brown, R.W. Kent R., and to be sec'd.; Dec. 28th, 1917. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank:—J. C. Davison; Dec. 2nd, 1917. J. E. Fitzpatrick; Dec. 13th, 1917. J. K. Blair, H. L. Brown; Dec. 14th, 1917. W. Amory, E. C. Burtin; Dec. 15th, 1917. A. V. Roger; Dec. 17th, 1917. J. T. Andrews; Dec. 20th, 1917. P. P. Cavanah; Dec. 22nd, 1917. T. S. Byrn; Dec. 23rd, 1917. M. E. Miller; Jan. 4th. C. J. Humphreys; Jan. 7th. Lieut. (Temp. Capt.) R. H. Marshall, North'n R., S.R., reverts from a Flight Comdr., and relinquishes his temp. rank; March 13th, seniority Oct. 21st, 1915. The notification in the *Gazette* of Jan. 22nd regarding Temp. 2nd Lieut. E. C. Brown, attd. R.W. Kent R., is cancelled.

*Flying Officers (Observers).*—Temp. 2nd Lieut. G. S. Chester, Gen. List, from a Flying Officer; March 3rd, seniority from May 19th, 1917. Lieut. L. H. Phelps, Linc. R., from Temp. Lieut., attd. Notts and Derby R., and to be sec'd.; Nov. 10th, 1917, seniority Oct. 10th, 1917. 2nd Lieut. L. J. Derrick, E. Kent R., S.R., seniority Nov. 14th, 1917, and to be sec'd.; Lieut. B. W. Edwards, R. Dub. Fus., S.R., seniority Nov. 28th, 1917 (March 8th). Seniority Nov. 28th, 1917:—2nd Lieut. J. Y. Baird, Sco. Rif. (T.F.), and to be sec'd.; March 7th. 2nd Lieut. H. E. Easton, Lond. R. (T.F.), and to be sec'd.; March 8th. March 7th, seniority Dec. 5th, 1917:—Temp. Capt. E. C. Powell, R.W. Fus., and to be sec'd.; R.F.C., Gen. List; Temp. Capt. M. S. E. Archibald, R.E.; and to be sec'd.; R.F.C., Gen. List:—Temp. 2nd Lieut. J. T. Wyre, Dorset R.; March 8th, seniority Dec. 8th, 1917. March 7th, seniority Dec. 2nd, 1917; Temp. Capt. L. I. Collins, York R.; Temp. Lieut. G. Bullen, R.W. Kent R.; Temp. 2nd Lieut. M. J. Wyatt, M.C., E. Kent R.; March 6th, seniority Dec. 12th, 1917. Temp. 2nd Lieut. R. A. Carter, York R.; March 8th, seniority Jan. 3rd. Lieut. J. S. W. Moll, W. Ontario R., Canadian Exped. Force; March 6th, seniority Jan. 29th. Temp. 2nd Lieut. (on prob.) J. H. Wilkinson, Gen. List, and to be confirmed in their rank; March 8th, seniority from Dec. 14th, 1917.

*Adjutant.*—Temp. Lieut. A. W. Brittain, Notts. and Derby R., to be trans'd. to R.F.C., Gen. List, and to be Temp. Capt. (without the pay or allowances of that rank) while so employed; March 3rd.

*Equipment Officers, 3rd Class.*—Capt. F. Campbell, L'pool R. (T.F.), and to be sec'd.; Lieut. T. C. L. Wood, Yeo. (T.F.), and to be sec'd.; Feb. 16th. Temp. 2nd Lieut. J. G. Daniel, attd. Welsh R., and to be trans'd. to R.F.C., Gen. List; and 2nd Lieut. W. B. Wood, S.R.; and 2nd Lieut. T. A. Burns, S.R.; Temp. 2nd Lieut. J. H. Loveridge, Gen. List; and 2nd Lieut. H. J. Dann, March 7th. Temp. Maj. H. P. Coles, High. L.I., and to be trans'd. to R.F.C., Gen. List; March 11th. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank:—A. Marr; Dec. 11th, 1917. E. V. Solomon; Dec. 14th, 1917. E. Bryant, N. B. Capes, C. F. Kempton; Feb. 11th. J. McKeown, T. G. Boyland; Feb. 14th. C. W. Bentley, E. T. W. Nockold, A. T. Wells, D. P. Jessup, R. S. A. Noakes, W. Stanton; Feb. 16th. J. A. Osborne; Feb. 19th. M. L. P. Reilly, T. M. Moilliet, E. Noble, J. G. Wright, A. D. Edwards, A. E. McCarthy, A. C. Hayes, F. H. Shaw, G. T. Godfrey, P. B. Jones, J. G. Peacock, R. M. Weaver, A. J. Adams, J. J. Clennell, E. B. Gray, A. Isles, A. Laurie; March 7th.

## Schools of Instruction.—School of Technical Training.

*Company Commander.*—(Graded as an Equipment Officer, 2nd Class).—Temp. Lieut. T. C. Martin, R. Fus., to be trans'd. to R.F.C., Gen. List, and to be Temp. Capt. (without the pay or allowances of that rank) while so employed; Dec. 11th, 1917.

*General List.*—Temp. 2nd Lieut. (Temp. Lieut.) R. C. Wansbrough, S. Staffs R., is trans'd.; Aug. 18th, 1917. Cadets to be Temp. 2nd Lieuts. (on prob.):—Pte. W. B. Fox, from Lond. R. (T.F.); Dec. 13th, 1917. 3rd Class Air Mech. J. H. Waugh, from R.F.C.; 3rd Class Air Mech. L. Rawlinson, from R.F.C.; Pte. L. Lievers, from Canadian A.S.C.; Dec. 31st, 1917. Spr. H. R. Scobell, from R.E.; Dvr. A. G. Marks, from A.S.C.; Jan. 3rd. Pte. J. A. Atkins, from Lond. R. (T.F.), 2nd Class Air Mech. G. Meikle, from R.F.C.; Jan. 5th. Pte. W. R. Healey, from Lond. R. (T.F.); Jan. 6th. Pte. W. E. Hall, from A.S.C.; Jan. 8th. Sgt. G. H. Bastin, from Glouc. R., Spr. E. A. Cherry, from R.E.; Jan. 9th. 3rd Class Air Mech. J. B. Seward, from R.F.C.; 3rd Class Air Mech. J. Hart, from R.F.C.; Jan. 10th. 3rd Class Air Mech. T. G. Blackwell, from R.F.C.; Cpl. G. E. Satterthwaite, from R.E.; Jan. 11th. Cpl. L. E. Hare, from R.F.C., to be Temp. 2nd Lieut. (on prob.) March 20th.

*London Gazette Supplement, April 10th.*

*Special Appointments.*—(Graded for purposes of pay as a Brig. Maj. while 2nd in Command of Cdt. Wing, R.F.C.—Lt. Maj. K. F. Woolhouse, Notts and Derby R., S.R.; Jan. 1st.

The following appointments are made:—

*Squadron Commander.*—Temp. Capt. A. J. Evans, M.C., Gen. List, from a Flight Comdr., and to be Temp. Maj. while so employed; Feb. 13th.

*Flight Commanders, from Flying Officers, and to be Temp. Capt. while so employed:*—Lieut. D. V. D. Marshall, A.S.C. (T.F.); Feb. 1st. Temp. Lieut. J. E. Addinsell, Gen. List; Temp. 2nd Lieut. F. Hyde, Gen. List; Temp. Capt. L. V. A. Royle, M.C., Gen. List; March 16th. Capt. B. Well, A.S.C., S.R.; Temp. Lieut. R. A. Preeston, Gen. List, and to be Temp. Capt. while so employed; Temp. Capt. O. Horsley, M.C., Gord. Highrs.; March 17th. And to be Temp. Capt. while so employed:—Lieut. E. D. Hall, North'd Fus. (T.F.); Temp. 2nd Lieut. R. D. Stanley, M.C., Gen. List; Temp. 2nd Lieut. O. E. Carter, Gen. List; March 23rd.

*Flying Officers.*—Lieut. F. C. Mair, High. L.I. (T.F.), and to be sec'd.; Jan. 26th. 2nd Lieut. B. Claxton, Som. L.I. (T.F.), and to be sec'd.; Jan. 29th. Temp. 2nd Lieut. J. Hawkins, S. Lan. R., and to be trans'd. to R.F.C., Gen. List; Jan. 30th. Lieut. G. J. A. S. O'Flaherty, Shrops. L.I., S.R., from L'pool R.; Jan. 31st. Capt. A. C. Chubb, A.S.C., and to be sec'd.; Lieut. A. P. Cragg, N. Lan. R., S.R., and to be sec'd.; Feb. 3rd. 2nd Lieut. L. C. Dodkins, Bord. R. (T.F.), and to be sec'd.; Feb. 4th. Capt. M. S. G. Bigwood, Wilts. R., S.R., and to be sec'd.; Feb. 5th. Lieut. A. Rose, Alberta R., Canadian Exped. Force; Feb. 26th. 2nd Lieut. H. Bledhill, R.F.A. (T.F.), and to be sec'd.; 2nd Lieut. J. F. V. Rider, Yeo. (T.F.), and to be sec'd.; Temp. 2nd Lieut. H. J. H. Dicksee, Gen. List, from a Flying Officer (Obs.), seniority Oct. 21st, 1916; Feb. 27th. Lieut. G. F. Hollington, Saskatchewan R., Can. Exped. Force; Feb. 28th. Temp. Lieut. R. K. Sherman, attd. Devon R., and to be trans'd. to R.F.C., Gen. List; March 1st. Temp. 2nd Lieut. D. R. Davies, M.G. Corps, and to be trans'd. to R.F.C., Gen. List; March 3rd. Lieut. M. S. Kelly, Magtoba R., Can. Exped. Force; March 6th. Lieut. W. G. Jewitt, E. Ontario R., Can. Exped. Force; March 7th. 2nd Lieut. T. G. Sifton, Mon. R. (T.F.), and to be sec'd.; March 8th. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank:—D. Y. Hunter; Dec. 12th, 1917. A. Alcorn; Dec. 19th, 1917. F. H. Beaufort; Dec. 20th, 1917. E. A. Chapin; Jan. 18th. A. Moore; Jan. 19th. A. R. Lapp (since killed); Jan. 23rd. C. Unbehau; Jan. 23th. K. Bon; Jan. 29th. B. V. Wilson; Jan. 30th. H. V. P. Lewis, R. T. W. Hill, J. L. Warwick; Jan. 31st. J. Maitland; Feb. 1st. W. H. O'Neill; Feb. 2nd. V. G. Humphreys; Feb. 3rd. J. A. Stretton, F. A. Flynn; Feb. 4th. P. B. Whillier; Feb. 6th. R. W. Hathaway; Feb. 9th. E. Frost, F. F. Norris; Feb. 11th. L. S. Wooding; Feb. 18th. S. L. Empson, D. Menzies; Feb. 25th. S. R. Elworthy; March 1st. C. J. Ramsbottom, W. W. Saunders, S. H. Owens, H. H. Gillingham; March 4th. F. A. Rowe, E. V. Hooper; March 5th. E. Snell, C. H. Tyreman; March 6th. W. I. Caven, T. H. Ames, M. W. H. Mackay; March 7th. R. H. Stainbank, F. Atkinson, S. H. Painter, R. L. Johnston; March 8th. B. H. Moody, L. E. Bickel, C. J. Ford; March 10th.

*Flying Officers (Observers).*—Temp. 2nd Lieut. L. C. Bailey, North'n R., and to be trans'd. to R.F.C., Gen. List; Jan. 15th, seniority from Aug. 18th, 1917. Lieut. R. H. Luxton, Canadian F.A.; Jan. 9th, seniority from Aug. 20th, 1917. Lieut. A. E. Gates, R.F.A., S.R.; Feb. 7th, seniority Sept. 9th, 1917. Temp. Lieut. J. C. Thompson, Shrops. L.I., and to be trans'd. to R.F.C., Gen. List; March 12th, seniority from Oct. 10th, 1917. Lieut. F. C. Aulagnier, Essex R. (T.F.), seniority from Nov. 12th, 1917, and to be sec'd.; 2nd Lieut. M. A. B. Boyd, E. Kent R. (T.F.), seniority from Nov. 20th, 1917, and to be sec'd.; Temp. Lieut. E. A. Matthews, Somerset L.I., seniority from Nov. 21st, 1917, and to be trans'd. to R.F.C., Gen. List; March 12th. Temp. 2nd Lieut. J. D. L. Welby, Leic. R., and to be trans'd. to R.F.C., Gen. List; March 9th, seniority from Dec. 7th, 1917. Seniority from Jan. 12th: 2nd Lieut. J. McC. Farquhar, High. L.I. (T.F.), and to be sec'd.; Temp. 2nd Lieut. J. A. Blythe, L'pool R., and to be trans'd. to R.F.C., Gen. List; 2nd Lieut. A. T. Harper, R.W. Fus. (T.F.), seniority from Jan. 28th, and to be sec'd.; Lieut. G. Mountain, R.G.A., S.R., seniority from Feb. 6th; Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank:—L. L. Medlen (since killed in action); Dec. 21st, 1917, seniority from Oct. 18th, 1917. J. Q. F. Walker; March 12th, seniority from Nov. 5th, 1917; March 12th. H. E. G. Bowen, seniority from Nov. 27th, 1917. R. H. Dennis, seniority from Dec. 5th, 1917; March 11th.

*Adjutant.*—Temp. Lieut. (Temp. Capt.) J. H. Jackson, Gen. List, ceases to hold his appointment; March 6th.

## Schools of Instruction.—Schools of Military Aeronautics.

*Assistant Instructor.*—(Graded as an Equipment Officer, 3rd Class).—Lieut. H. E. Haslehurst, L'pool R., a Flying Officer; March 18th.

## School of Technical Training.

*Assistant Instructor.*—(Graded as an Equipment Officer, 2nd Class).—Temp. Lieut. H. E. Hotchin, Gen. List, from Officer in charge of Stores (graded as an Equipment Officer, 2nd Class); Oct. 12th, 1917.

*General List.*—Temp. Capt. F. A. Forde, Gen. List, relinquishes the rank of Temp. Lieut.-Col. on ceasing to hold the appointment of Comdt. Off. Technical Training Corps; March 11th.

*London Gazette Supplement, April 11th.*

The following appointments are made:—  
*Squadron Commander.*—Lieut. (Temp. Capt.) C. A. Ridley, D.S.O., M.C., R. Fus., from a Flight Comdr., and to be Temp. Major while so employed; Mar. 19th.

*Flying Officers.*—Temp. Lieut. G. R. O'Sullivan, Gen. List, from a Flying Officer (Observer); Dec. 12th, 1917, seniority from Jan. 30th, 1917. Temp. Lieut. G. C. Macintosh, Gen. List, from a Flying Officer (Observer); Jan. 12th, seniority Oct. 5th, 1916. Lieut. A. G. Lough, Canadian Army Dental Corps; Feb. 23rd. Temp. 2nd Lieut. F. K. Heywood, A.S.C., and to be trans'd. to R.F.C., Gen. List; Mar. 4th. Major F. J. Tanner, Nova Scotia R., Canadian Exped. Force, Lieut. R. E. Heath, Welsh R. (T.F.), from a Flying Officer (Observer), seniority from Feb. 23rd, 1917. Lieut. I. L. Barnhill, Nova Scotia R., Canadian Exped. Force; Capt. P. R. White, E. Ont. R., Canadian Exped. Force; Mar. 7th. Temp. 2nd Lieut. C. F. Brown, attached Durh. L.I., and to be trans'd. to R.F.C. Gen. List; Mar. 8th. Temp. Lieut. J. Langlands, R. W. Kent R., and to be trans'd. to R.F.C. Gen. List; and 2nd Lieut. H. D. White, R. Lanc. R. (T.F.), and to be sec'd.; and 2nd Lieut. A. F. Scroggs, R.G.A., S.R.; Mar. 9th. Lieut. C. E. G. Gill, Cambridge R. (T.F.), and to be sec'd.; Mar. 11th. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank:—H. L. Brackey; Jan. 4th. F. Latham; Jan. 8th. H. L. Hopkins; Jan. 18th. J. W. Blagge, C. Oxberry, L. C. P. Green; Feb. 11th. W. E. Neville, C. M. Martin, H. Garnett; Feb. 12th. C. E. Lacoste; Feb. 16th. F. L. Milner; Feb. 24th. W. G. C. Jones; Feb. 25th. A. Lewis; Feb. 28th. F. B. Baker, Mar. 3rd. A. A. Payne, E. A. Jones; Mar. 5th. E. Bryant, W. Dobeson, S. B. Croymen; Mar. 7th. R. E. Mansfield, H. D. R. Davies, L. S. Birch, J. K. Carruth; Mar. 8th. J. D. Egan, B. L. McCarthy, R. C. Carver, F. Carpenter, D. Watt, R. Pughe, M. Taylor, T. T. Taylor, T. M. Thomson, G. F. Townsend, G. Anderson, F. Steel, C. G. Langford, A. M. Bain; Mar. 9th. S. H. Vickers,



P. T. A. Reveley, R. A. C. Skipper; Mar. 10th. C. W. McK. Thompson, R. I. Drake; Mar. 11th. The appointments of the following Temp. 2nd Lieuts. Gen. List, are antedated as follows:—T. G. Blakeley, to Dec. 29th, 1917; R. B. Hill, to Jan. 1st; D. L. Holmes, to Jan. 3rd.

**Equipment Officers, 2nd Class.**—Temp. Lieut. F. O. Burnley, Gen. List; Feb. 1st (substituted for the notification in the Gazette of Feb. 23rd). 3rd Class.—Qr. Mr. and Hon. Capt. F. C. Marsh, Hrs., and to be Temp. Capt. while so employed; Mar. 1st.

**General List.**—To be Temp. 2nd Lieuts.:—Sgt. W. E. Neville, from R. Suss. R. (T.F.); Jan. 3rd. 1st Cl. Air Mech. C. M. Martin, from R.F.C.; Jan. 5th. To be Temp. 2nd Lieuts. (on prob.):—C. W. Gigg, R. K. McLean, F. T. Sanford; Feb. 11th. O. H. C. Webb; Mar. 11th. W. L. Eveleigh; Mar. 21st. 1st Cl. Air Mech. F. Batterbury, from R.F.C.; 1st Cl. Air Mech. A. W. Clare, from R.F.C.; Cpl. H. N. Farmer, from R.F.C.; Cpl. C. J. French, from R.F.C.; 1st Cl. Air Mech. J. H. C. Harrold, from R.F.C.; 1st Cl. Air Mech. W. H. Hildreth, from R.F.C.; 1st Cl. Air Mech. J. G. F. Moore, from R.F.C.; 2nd Cl. Air Mech. E. S. Robilliard, from R.F.C.; Cadet M. J. F. Underwood, from R.F.A.; Mar. 26th.

**Supplementary to Regular Corps.**—2nd Lieuts. to be Lieuts.:—N. E. S. Simon; Dec. 3rd, 1917. G. Craig; Jan. 15th. H. J. Robinson, A. W. O'Q. Shire; Jan. 31st. W. F. J. Matthews; Feb. 24th. A. J. J. Lamb, R. H. New; Feb. 28th.

*London Gazette Supplement, April 12th.*

The following appointments are made:—

**Flight Commanders.**—From Flying Officers.—And to be Temp. Capt. while so employed:—Temp. Lieut. G. E. Gibbons, Gen. List; Temp. 2nd Lieut. W. E. Theak, Gen. List; March 21st. Temp. 2nd Lieut. F. S. McClurg, Gen. List; March 28th.

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—S. E. Gane; Dec. 24th, 1917. R. K. Rose, T. S. Harrison, M. H. Hanrahan, A. Pilling, H. Vick, F. Woolley; March 12th. B. F. Dunford, L. J. Cox; March 13th.

**Schools of Instruction.**—Schools of Military Aeronautics.

**Assistant Instructor.**—(Graded as an Equipment Officer, 2nd Class).—The rank of Capt. R. C. Morgan, Canadian Local Forces, is as now described, and not as in the Gazette of Feb. 26th.

**Supplementary to Regular Corps.**—The following 2nd Lieuts. to be Lieuts.:—W. D. L. Jupp; July 1st, 1917. A. Carruthers, H. J. Whittingham, E. P.



## The Premier's Speech.

IN his speech introducing the Man Power Bill into the House of Commons on April 9th, Mr. Lloyd George made the following references to aircraft.

Speaking of the enemy's resources he said:—"In Infantry they were slightly inferior, in artillery they were inferior, in cavalry, they were considerably inferior, and, what is very important, they were undoubtedly inferior in aircraft."

Dealing with the German preparations he said:—"The defence has a general advantage. Owing to air observation concealment is difficult. At the same time, in spite of all that, owing to the power of moving troops at night, which the Germans exercised to a very large extent, there is a large margin for surprise, even in spite of air observation, and of this the enemy took full advantage."

On the subject of our resources the Prime Minister went on: "Our aircraft strength is greater now than before the battle, and we all know what brilliant service our airmen have rendered in this battle. Until the whole story of the battle is told it would be almost impossible to estimate the services they have rendered in retarding the advance of the enemy, in destroying his machinery, and in making it difficult for him to bring up his guns and ammunition."

## A Raid on Paris.

A NUMBER of German aeroplanes on the night of April 12th crossed the lines in a southerly direction. Only two of them succeeded in flying over the Paris district, where they dropped a few bombs. Twenty-six persons were killed and 72 were injured. A considerable amount of material damage was done. Where the bombs fell not a pane of glass is left for a considerable distance, and the roads are covered with debris and trees which have been torn out by the roots. One bomb made a hole 10 ft. deep and 6 ft. wide. The next day large crowds visited the damaged districts, which had been barricaded off by the police. The warning was given at 10.10 p.m., and the "all clear" at 10.40.

## Paris Raider Down.

It appears that one of the Gothas which attacked Paris on April 12th was brought down in the neighbourhood of Compiègne. At the beginning of the raid it was seen to send out a red flare, and almost immediately afterwards it dropped its bombs. Then it descended rapidly and capsized on striking the tree tops. The forest was searched later, and four dead bodies were found lying among the bracken. The pilot was a lieutenant decorated with the Iron Cross. The bomber was a captain, and the machine-gunner was a lieutenant. The mechanic had in his haversack a number of proclamations intended for Paris. The Gotha measures nearly 80 ft. from tip to tip, and is armed with three machine-guns and five bomb-carriers.

## Hydroplane v. Motor Schooner.

It has been reported by Lloyd's agent at Amsterdam that the Dutch motor schooner *Anna*, bound from Rotterdam for Gothenburg, recently put into Ymuiden damaged "in

Lyon, H. A. Howell, W. M. Kent, C. L. Milburn; Dec. 3rd, 1917. G. B. Redgrave; Dec. 5th, 1917. R. G. Booth; Dec. 12th, 1917. R. W. B. Billinghurst; Dec. 13th, 1917. A. O. Betts, G. A. Lawlor; Dec. 14th, 1917. J. E. R. Avery; Dec. 15th, 1917. T. E. Gorman, M. H. Butler, D. S. Kennedy, M. C. T. Hayes, N. B. Lovemore; Dec. 17th, 1917. M. Myers, E. G. Herbert, W. E. Bousfield; Dec. 19th, 1917. E. G. Boulenger; Jan. 1st. S. Morris, A. H. Meldrum, H. Darnell; Jan. 7th. A. E. Neal, B. Welch, J. W. Gardner, G. T. Pettigrew, C. A. Pike, R. E. Littell, G. V. Cottam; Jan. 8th. R. J. Cowan; Jan. 9th. P. Maggs, R. H. Tweedy, F. C. Mears, N. L. Godber, G. L. Bennet, G. E. Upton; Jan. 10th. L. L. Carter, R. W. Farquhar, J. J. Scaramanga, R. C. Orlebar, F. W. Keddie, A. L. C. Hartland-Rowe; Jan. 22nd. J. M. Scott; Jan. 24th. W. B. Brett, H. B. T. Hawkins; Jan. 25th. E. B. Smyth, A. C. Kiddie; Feb. 1st. A. S. Cox; Feb. 2nd. D. W. Wilson; Feb. 3rd. L. H. Gibbon; Feb. 5th. C. McM. Russell; Feb. 11th. W. E. Jones, G. W. Dowding; Feb. 12th. H. J. Barwick, C. H. Butcher, W. Birtwistle, D. Alexander; Feb. 14th. R. W. Anderson; Feb. 17th. C. J. W. Hosken; Feb. 21st. M. R. Grover; Feb. 22nd. A. C. Hartley; Feb. 23rd. E. Butler; Feb. 24th.

*London Gazette, Supplement, April 13th.*

The following appointment are made:—

**Flying Officers.**—Temp. Sec. Lieut. D. McI. McFarlane, Sco. Rif., and to be transfd. to R.F.C. Gen. List, Feb. 8th. From Flying Officers (Observers):—Lieut. R. B. Ellis, D. of Corn. L.L., S.R., seniority Mar. 3rd, 1917; Lieut. V. S. Rowbotham, R.F.A., S.R., seniority Jan. 9th, 1917; Feb. 10th. Lieut. C. D. Chapman, Yeo. (T.F.). Temp. Lieut. W. E. Gibbon, A.S.C., and to be transfd. to R.F.C. Gen. List; Lieut. W. P. Watt, Sco. Rif., S.R., from attd. Garr. Bn.; Temp. Lieut. W. I. Hannon, R. Ir. Regt., and to be transfd. to R.F.C. Gen. List; Feb. 11th. Lieut. E. W. J. Cass, E. Surr. R., S.R., and to be sec'd. Feb. 12th. And to be transfd. to R.F.C. Gen. List:—Temp. Lieut. E. Evans, Garr. Bn., Ches. R.; Temp. 2nd Lieut. A. J. Virgo, R. Suss. R.; Temp. 2nd Lieut. J. H. L. Purkess, attd. Hamps. R.; Lieut. J. A. Bruce, Yeo. (T.F.), and to be sec'd.; Feb. 13th. Temp. 2nd Lieut. S. C. Farrington, Br. W. Ind. R.; Feb. 15th. Lieut. L. Rimmer, W. Ontario R., Canadian Exped. Force; Feb. 20th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—W. A. B. Probert; Nov. 30th, 1917. T. S. Nash; Mar. 4th. A. Duncan, C. McW. McMillan, A. Sharman, A. O. Bentley; Mar. 8th. D. B. Barbour, T. R. Dawson, A. L. Stockenstrom, L. Young; Mar. 10th.

**Supplementary to Regular Corps.**—2nd Lieut. (on prob.) J. Gitsam is confirmed in his rank.

consequence of being shot at by a foreign hydroplane. The forepeak is full of water."

## Submarine and Aeroplane Co-operate.

A GERMAN submarine fired seven shells on the morning of April 10th against the small island of Kastelorizo, near Rhodes Island, occupied by the French. When the bombardment began an enemy aeroplane appeared over the island and dropped two bombs.

## Fire at Zeppelin Factory.

INFORMATION received from Zurich reports that a fire broke out at the Zeppelin factories at Manzell, Friedrichshafen, between 10 and 11 p.m., on April 12th. The fire raged all night, and there was a violent explosion which is said to have destroyed many houses in Manzell and Friedrichshafen.

According to *La Suisse* the workshops formerly engaged in building Zeppelins, and now manufacturing the F.F. bombing planes, were burnt down. The Zurich correspondent of the *Matin* reports that two gas reservoirs, two Zeppelins, and 40 large bombing aeroplanes were destroyed. Some 20 explosions were counted, and it is stated that 140 people were killed and over 200 wounded. Another report received in Paris says that it was definitely reported in Germany at the time of the fire that there were 30 complete squadrons of aeroplanes being kept in reserve at Friedrichshafen for the special purpose of fighting the American aerial fleet; the losses must therefore have been heavy. A message from Geneva to the *Temps* states that the fire was caused by a bombardment by Allied aviators, but another report says that incendiarism is suspected.

## A French Machine in Holland.

A FRENCH aeroplane had to make a forced landing near Bitthem at 3 a.m. on April 12th, according to the *Handelsblad*, after having taken part in a bombing attack on Zeebrugge. The three occupants of the machine, two of whom were officers, set the machine on fire. They themselves were unhurt, and are to be interned.

## More Aeroplanes from Overseas.

MEMBERS of the Overseas Club and Patriotic League have collected enough money for the presentation of two additional aeroplanes to the Royal Air Force to be known as "Overseas Britons" Nos. 10 and 11.

## The R.F.C. in the War.

It is a cheery book which "Wing Adjutant" has written, and the seventeen chapters which go to its making give quite a convincing picture of life in the R.F.C. under war conditions. Most of the tales and sketches were actual experiences of the writer; one or two are admittedly imaginative, but they are none the less possible. The Western Front is the scene of most of the flying work, but one chapter is devoted to "Other places—other methods," and gives us some peeps at the R.F.C. at work in the East, where Wing-Adjutant was stationed during the greater part of 1917. The book is published (in cloth binding) by Messrs. Cassell at 2s. net, and it would be more than good value at much more than that.



## AVIATION IN PARLIAMENT.

### Royal Air Force.

COLONEL FABER, in the House of Commons on April 11th, asked the Prime Minister whether the Air Minister is responsible for the destinations, use, and objectives of aircraft and airmen, or whether the military authority is solely responsible in respect thereto?

The Under-Secretary of State to the Air Ministry (Major Baird): The Air Council, after consultation with the Admiralty and War Office, allot the aircraft available to naval and military commanders according to the requirements of the forces they command. The naval or military commander is responsible for the use of aircraft thus allotted, subject to any special instructions issued by the Government from time to time. The aircraft allotted to naval and military forces are under the command of an R.A.F. officer, through whom all orders are issued.

Colonel Faber: Arising out of that, may we understand that the Air Minister has only responsibility for the output of aircraft?

Major Baird: No, Sir; you may not understand that at all.

Mr. Billing: Will the hon. gentleman say whether the Air Minister is capable on his own responsibility of initiating air raids, or any attack he may see fit to do? [No answer was given.] Really, there should be some limit to the insults of Parliamentary nonentities!

Mr. Speaker: And there should be some limit to the insults that are offered.

Mr. Pringle: Is not a member entitled to an answer?

Mr. Speaker: If he gives proper notice.

### Anti-Aircraft Corps Discharges.

CAPTAIN D. HALL asked the Prime Minister whether he can state to the House the number of part-time men of the Royal Navy Anti-Aircraft Corps employed in the defence of London who have been discharged or left the service during the last four months and the approximate number of whole-time men who have taken the place of the men so discharged or disbanded; and whether he can state the reasons why many highly trained men who have served for three years or more on the searchlight and anti-aircraft gun stations in the Metropolitan area are, at a time when there are so many demands being made on the manpower of the nation, being dismissed or discharged?

Mr. Macpherson: One hundred and twenty-seven part-time men have been discharged during the last four months, and forty full-time men have been taken on. With regard to the last part of my hon. and gallant friend's question, I have nothing to add to the answers which I have already given on this subject on January 23rd and 28th and February 5th last.

### R.N.A.S. Transport Section.

Mr. JOYNSON-HICKS asked the Under-Secretary of State to the Air Ministry what are the respective wages and billeting allowances of men and women drivers in the transport section of the Royal Naval Air Service?

Major Baird: The practice in the Royal Naval Air Service was to enter men

drivers as air mechanics, 2nd class, at 2s. a day, with the prospect of subsequent advancement up to leading mechanic at 5s. a day. Separation allowances were granted at the ordinary naval rates, together with lodging and provision allowances of 2s. 8d. a day if accommodation and victualling were not provided in kind. Earlier in the war a number of drivers were entered at special higher rates. Women drivers in the Women's Royal Naval Service received 35s. or 40s. a week inclusive, but if accommodated under Government arrangements 14s. was deducted to cover board, lodging, service, and washing. In the Women's Royal Air Force the rates run 28s. (for probationers) in the first month, and after one month 38s. to 45s. a week inclusive.

### Baluchistan Air Raid.

Mr. TREVELYAN asked the Secretary of State for India whether the statement that our aeroplanes have been bombing the tribal concentrations of the Maris of Baluchistan means that purely military posts have been attacked or places where women and children are liable to be present?

Mr. Herbert Fisher: The telegram received by the Secretary of State for India speaks of "tribesmen" and "an enemy gathering" of Maris having been bombed by our aeroplanes. There is no reason to suppose that places were thus attacked where women and children were likely to be present.

### Aeroplane Postal Service.

Mr. GILBERT asked the Postmaster-General whether his attention has been called to the establishment of aeroplane postal services in America; and whether he can state if any experiments have been made with a view of establishing such an aeroplane postal service between large towns in this country?

Mr. Illingworth: I have seen statements in the Press with regard to the establishment of an aeroplane service for mails between Washington and New York, but I have no official information on the subject. It is not proposed to establish experimental aerial services in this country at present, as the whole resources of the aeroplane industry are required for military purposes.

### General Trenchard's Resignation.

Mr. JOYNSON-HICKS on April 15th asked the Under-Secretary to the Air Ministry if he can make any statement regarding the resignation of General Trenchard.

The Under-Secretary of State to the Air Ministry (Major Baird): I have no statement to make beyond that the resignation resulted from the fact that General Trenchard took a view as to the powers and duties of the Chief of the Air Staff which the Secretary of State for the Royal Air Force could not accept. I am authorised by the Secretary of State to say that, personally, he yields to nobody in appreciation of General Trenchard's high qualities, and much regrets that a difference of opinion on a point of principle should have arisen.

Mr. Joynton-Hicks: Is it proposed to utilise General Trenchard's services in any other capacity?



## SIDE-WINDS.

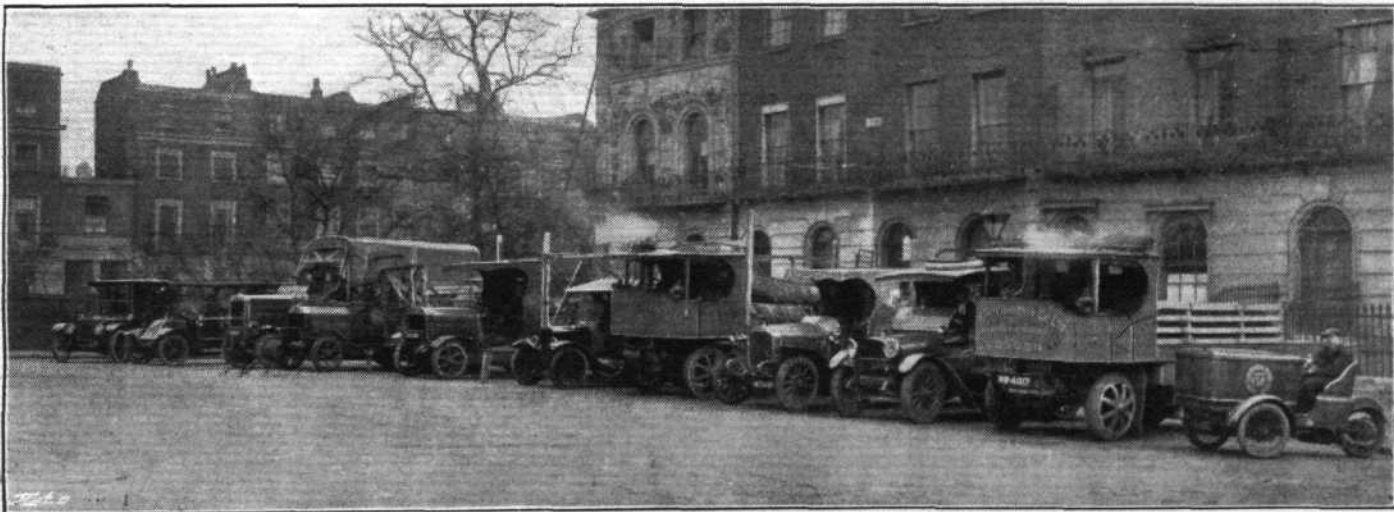
THE need for new-laid eggs for our wounded was never so great as it is at the present moment, and the eggs never so difficult to obtain. It is essential therefore that every one who can will lend their aid, however small, to make the National Egg Day on Monday, May 27th, a very great success. Ladies are wanted to sell flags and emblems, and if they can only spare part of a day their assistance will be welcomed. One or two cars are also wanted to assist in the transport and collection organisations. All offers of help, however small, will be gratefully received by the Organiser, National Egg Day, 4, Rupert Street, W. 1.

FROM an article entitled "Life in Essen," which appeared in the *Daily Mail* recently, it appears that the Kaiser paid a tribute to the excellent qualities of Wakefield Castrol "R" a little while back. When one of our big machines descended, in error, during a thick fog, in the German lines, it caused so much stir that the Kaiser paid a special visit to see it. The machine was put to a trial spin, and when it climbed up to about 10,000 ft. the Kaiser remarked to General Hoppner,

"At such a height and on so cold a morning, how is it that the lubricants do not freeze?" In reply to which the General remarked, "The British have discovered that which we have been endeavouring to find for a month."

Mr. K. B. MACDONALD, who is well known in connection with the Curtiss enterprises at Buffalo, has been given a commission in the U.S. Navy as Lieut.-Commander, and is now in charge of one of the Naval aircraft factories. Mr. MacDonald, while he lived in Buffalo, was the vice-president and the general manager of the Curtiss Aeroplane Company. He is a former vice president and director of the Curtiss Aeroplane and Motor Corporation. Since last September, Mr. MacDonald has been in Garden City, Long Island, at the aeronautical research laboratory and workshop of the Curtiss Engineering Corporation. He is one of the pioneer production men in the American aviation industry.

IN connection with the London Munitions Football League Messrs. P. Napier and Son provided a concert at the Holborn Hall on April 9th which was far above the average of similar

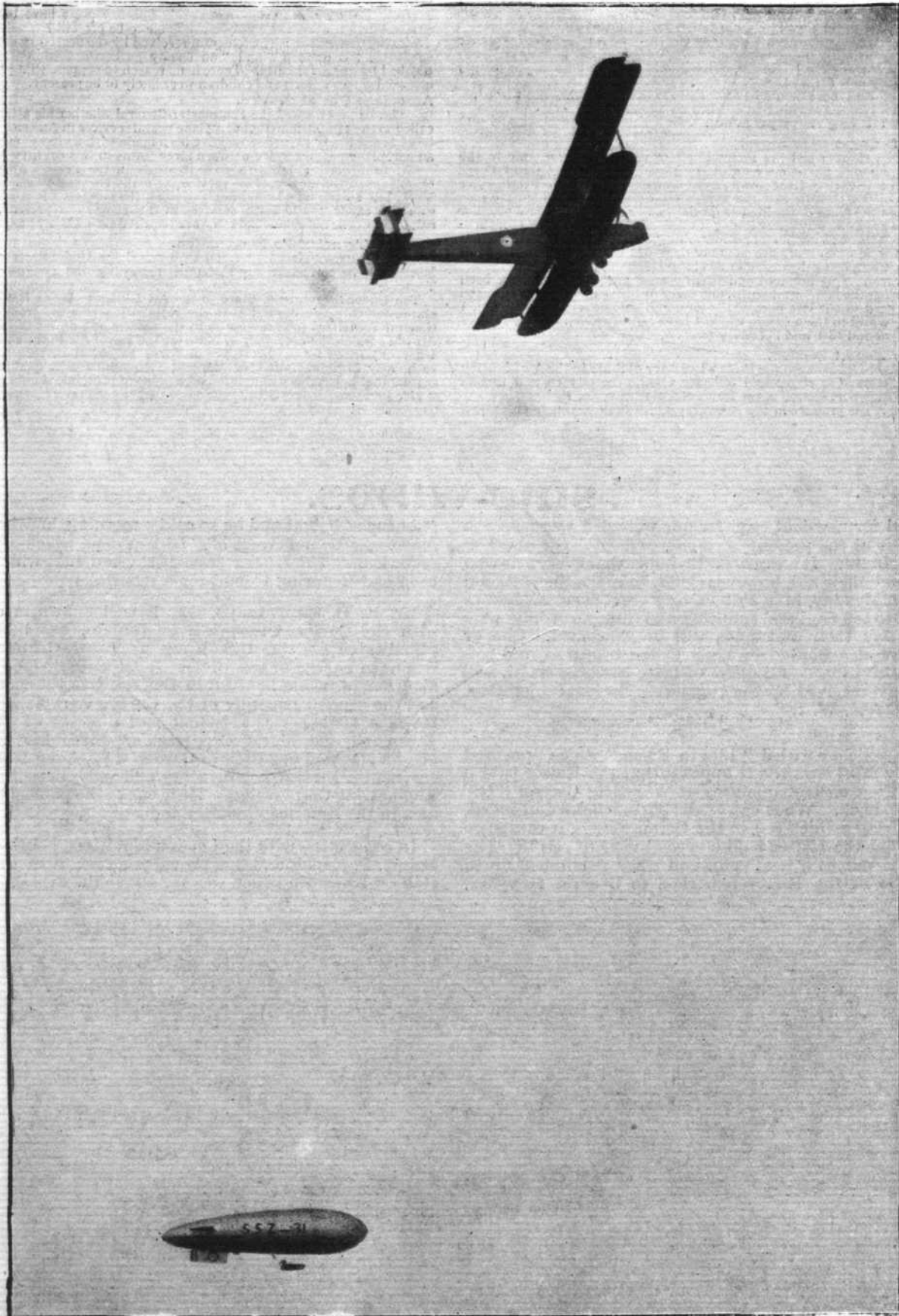


The Davidson Aviation Co.'s fleet of service cars and lorries, comprising one 22 h.p. Charron, one 38 h.p. Daimler, two 35-40 British Berna 3½-tonners, one 35-40 Swiss Berna, one 20 h.p. Ford, two 6-ton Sentinel steam lorries, one 20 h.p. Reo 1-tonner, one 5½ h.p. Auto-Carrier, one 40 h.p. Leyland, and one 12 h.p. Rover. Truly "some" cosmopolitan gathering.

entertainments. The programme included the names of a number of artistes well known on the variety stage and the concert platform, and thanks to the good fare provided and the excellence of the management everything went with a swing from start to finish so that the large audience of nearly a thousand did not have to complain of a single dull moment.

Mr. Sammy Shields delighted the audience with his inimitable Scots humour. Madame Laura Evans-Williams, an accomplished artiste, sang the "Jewel Song" from "Faust" and as an encore sang a delightful little song in

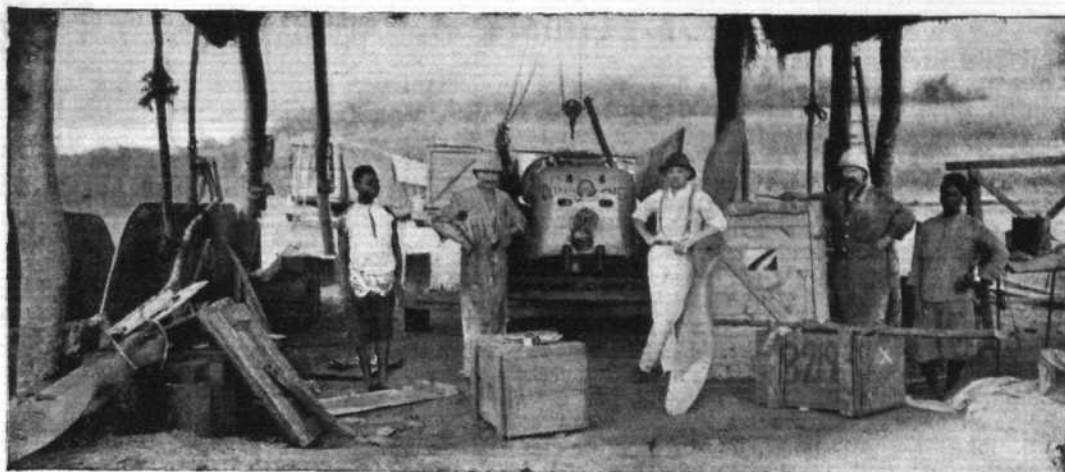
Welsh. Wee Jock Bell and Miss Dorothy Dean were very amusing in a golfing sketch. Miss Dorothy Whittall simply took her audience by storm with her delightfully finished rendering of "Homing," with organ accompaniment, and as an encore sang "Absent" in a manner which showed that she possesses not only a beautiful voice, but one that is held under perfect control. Later she sang "Your England and Mine," and as an encore "The Beautiful Country of Dreams." This very talented young singer will go far in her profession. Mr. G. E. Mitchell was very good in a topical song entitled



The Handley Page bombing machine, fitted with Sunbeam-Coatalen aircraft engines, photographed whilst flying over London. Note the Army airship in the bottom of the picture.



**Assembling a  
Sunbeam-Coatalen "Short"  
waterplane in  
East Africa.**



**Mr. L. Coatalen, Joint Managing Director of the  
Sunbeam Motor Car Co., Ltd., and designer of the  
Sunbeam-Coatalen aircraft motors.**

"Hey, Derry Down Dey." Among others who contributed to the evening's amusement were Mr. Tudor Evans; Miss Janet Evans; Kisby, "The Call Boy"; and Miss Georgia Drayson. During the evening Sir Arthur Yapp gave a short address on the work of the Y.M.C.A. among our troops at the front and at home, and a collection in aid of the Association's fund for the entertainment of wounded soldiers at the Y.M.C.A. headquarters was made.

THE May number of Lloyd's Magazine has many attractive features, including the first of a series of six articles by Commander Locker-Lampson, R.N.A.S., entitled "Condemned by the Kaiser." They tell in breezy style some of the adventures of Commander Locker-Lampson's squadron of armoured cars in France, Belgium, Roumania, and Galicia—as a result of which the Kaiser offered a reward of 20 000 marks for his capture, dead or alive. There is also the opening instalment of a serial by E. Phillips Oppenheim, stories by J. O. Curwood, J. S. Fletcher, Kitty Lofting, A. Demail Grange and G. A. Birmingham, and a topical article, "Twenty Years after the War," by "Onlooker," besides other items which make it good value at eightpence.

To the March issue of the *World's Work* Mr. F. A. Talbot contributed an interesting story of the Sunbeam-Coatalen aero engine, which has now been reprinted by the Sunbeam Motor Car Co., Ltd., of Wolverhampton, in the form of a booklet. We have called it a story because it is not an article of the usual descriptive kind, and it throws many a telling side-light on to reasons which led to the production of the Sunbeam motor, in its application to aircraft, as we know it to-day. Sunbeam engines are now playing their part in various aircraft in practically every theatre of war, and from the large number of illustrations in the booklet we are reproducing three, one showing a Sunbeam-engined Handley Page bombing machine, while the other two are of a Short water-plane out in East Africa. At the same time we are reproducing a photograph of Mr. Louis Coatalen, the genius behind the engine, who, it will be recalled, read a most instructive paper on the subject some months ago before the Aeronautical Society. He is joint managing director of the Sunbeam Motor Car Co., Ltd. Anyone who would like a copy of the booklet should write to the Sunbeam Co. at Wolverhampton.



**Launching a  
"Short" sea-  
plane on Lake  
Tanganyika.**

## LEGAL INTELLIGENCE.

### Similarity in Trade Names.

In the Court of Appeal on April 10th Aeroplane General Sundries, Ltd., appealed against an injunction granted, at the instance of the A.G.S. Manufacturing Co., Ltd., by Mr. Justice Neville (see "FLIGHT" for March 9th), restraining defendants, their servants or agents, from representing by advertisement or otherwise that the letters A.G.S. stood for or were otherwise the name of the defendant company.

Lord Justice Swinfen Eady, in his judgment, explained that A.G.S. stood in the aeroplane trade for Aeronautical General Schedule or Aeronautical General Sheets—a list of aeroplane parts prepared by the Royal Aircraft Factory in which each part was identified by a number. He said that it was not in dispute that anyone was entitled to make and sell these aeroplane parts and describe them as A.G.S. parts. The matter complained of was the use by the defendant company of A.G.S. not to describe parts, but to describe the defendant company. The first advertisement that had been complained of was one in which the defendant company described themselves as A.G.S. (Limited). The plaintiff company had complained of this and the advertisement had been discontinued. It was not suggested that the plaintiff company had a monopoly to A.G.S. as part of their name, and with sufficient variation to differentiate it from the plaintiff company another body could use the letters; but the complaint against the defendant company was that they had used A.G.S. in a manner calculated to deceive. Thus one of their advertisements contained this:—"Aeroplane General Sundries, Limited (the official meaning of A.G.S.)." This was not true. Another advertisement was this:—"A.G.S. stands for Aeroplane General Sundries, Limited." This again was wholly untrue. The explanation given by the defendant company of their use of the earlier advertisement, which was discontinued, was not satisfactory, and, after the warning they had then received from the plaintiff company, their subsequent use of those other advertisements and the attempt to justify their use in Court satisfied him (his Lordship) that Mr. Justice Neville was right.

The learned Judge had marked his view of the case by ordering the defendant company to pay the costs of the motion in any event. That was a very unusual order, but in this case the learned Judge was justified in marking his disapproval of the defendant company by the order which he made. The defendant company had sought to use A.G.S. in a manner calculated to deceive, and the appeal must be dismissed, with costs.

Lord Justice Warrington gave judgment to the same effect.

It was then agreed that the motion should be treated as the trial of the action and the injunction made perpetual.

## CORRESPONDENCE.

**A.G.S. Manufacturing Co., Ltd., v. the Aeroplane General Sundries, Ltd.**

[1956] I presume you will be publishing in your next issue a report of the recent appeal brought by this Company in the Court of Appeal in the case of the A.G.S. Manufacturing Co., Ltd., v. the Aeroplane General Sundries, Ltd. An injunction was granted against the latter Company to restrain it "from representing by advertisement or otherwise that the letters A.G.S. stand for or are another name for" Aeroplane General Sundries, Ltd. It was suggested that I had intended to confuse it with the A.G.S. Manufacturing Co., Ltd. It will not be necessary for me to assure the many friends I have in the aircraft industry that nothing has been further from my intention. The trouble arose in the first instance through a statement made in one of my earlier advertisements. This statement was made in perfectly good faith. Immediately the point was raised the advertisement was discontinued, and I have always done my best to give prominence to the full name and address of my Company, and I fail to see how any possible misunderstanding could arise.

The Appeal Court has now seen fit to confirm the decision of Mr. Justice Neville, and I should therefore be very grateful if you would allow me to emphasise through the medium of your journal, that Aeroplane General Sundries, Ltd., is a Company founded by me, to manufacture and deal in A.G.S. parts, and has no connection with any other firm or company.

In a serious national crisis like the present every woman is bound to do her utmost to serve her country, and it is my sole ambition to be of real service to the aircraft industry, in which I have always taken a real interest. I hope that in spite of this unfavourable legal decision, or even because of it, I may rely on the continued and increased support of all

who are assisting in the production of the aeroplanes on which the safety of our country depends.

Thanking you in anticipation of your courtesy,

FOR AEROPLANE GENERAL SUNDRIES, LTD.

DORIS M. NICHOLSON,

Managing Director.

Fulwood House, Fulwood Place,

High Holborn, London, W.C. 1, April 15th, 1918.

## COMPANY MATTERS.

### Vickers, Ltd.

THE directors of Vickers, Ltd., recommend a final dividend for 1917 of 1s. 6d. per share on the ordinary shares, making 2s. 6d., or 12½ per cent., tax free (same as for 1916), for the year, payable May 10th.

### Vauxhall Motors, Ltd.

THE report of Vauxhall Motors, Ltd., for 1917 states that there has been a still further increase in trading over previous years, and with the greater output due to the new shops the directors anticipate an increase of 50 per cent. on the turnover for the current year. They regret that they are still unable to submit the usual accounts owing to the delays in settling the amount of excess profits duty and special taxation payable by the company. Business at the annual meeting to be held at Winchester House, E.C., 19th inst., noon, will be formal, and shareholders will be asked to sanction the declaration of a final dividend of 1s. 3d. per share, less tax, making 10 per cent., for the year.

### NEW COMPANIES REGISTERED.

COMMERCIAL AIRCRAFT AND ENGINEERING CO., LTD., Throgmorton House, Copthall Avenue, E.C.—Capital £20,000, in £1 shares. First directors: H. J. Prosser, C. Hollingshead, A. Hollingshead, F. H. Statham, and T.S. Wright.

LACTOCOL, LTD., 31, Lombard Street, E.C.—Capital £5,000, in £1 shares. Acquiring business of manufacturers of "Lactogol" carried on by N. C. A. Ouwehand and W. C. Stewart at 2 and 2A, Studley Road, Stockwell, S.W., manufacturers of and dealers in glue, aeroplanes and parts thereof, plywood, &c. First directors: H. Pyttersen, N. C. A. Ouwehand, and W. C. Stewart.

### BUSINESS NAMES REGISTRATIONS.

CO-OPERATIVE GAUGE AND PRECISION TOOL-MAKERS' ASSOCIATION.—Registered January 18th, 1918. Gauges for aircraft and submarine work, tools, small parts for naval guns, &c., 56, Myddleton Street, E.C.1. Partners: (1) Hubert Elkerbout (Dutch), 23, Myddleton Square, E.C.1; (2) T. Broeder (Dutch), 27, St. Martin's Avenue, East Ham, E.6.

### PUBLICATION RECEIVED.

The Aviation Pocket Book for 1918. By R. Borlase Matthews. London: Crosby Lockwood and Son. Price 6s. net.

### NOTICE TO ADVERTISERS.

IN order that "FLIGHT" may continue to be published at the usual time, it is now necessary to close for Press earlier. All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages I, II, and III).

## FLIGHT

and The Aircraft Engineer.

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